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CITY GOVERNMENT

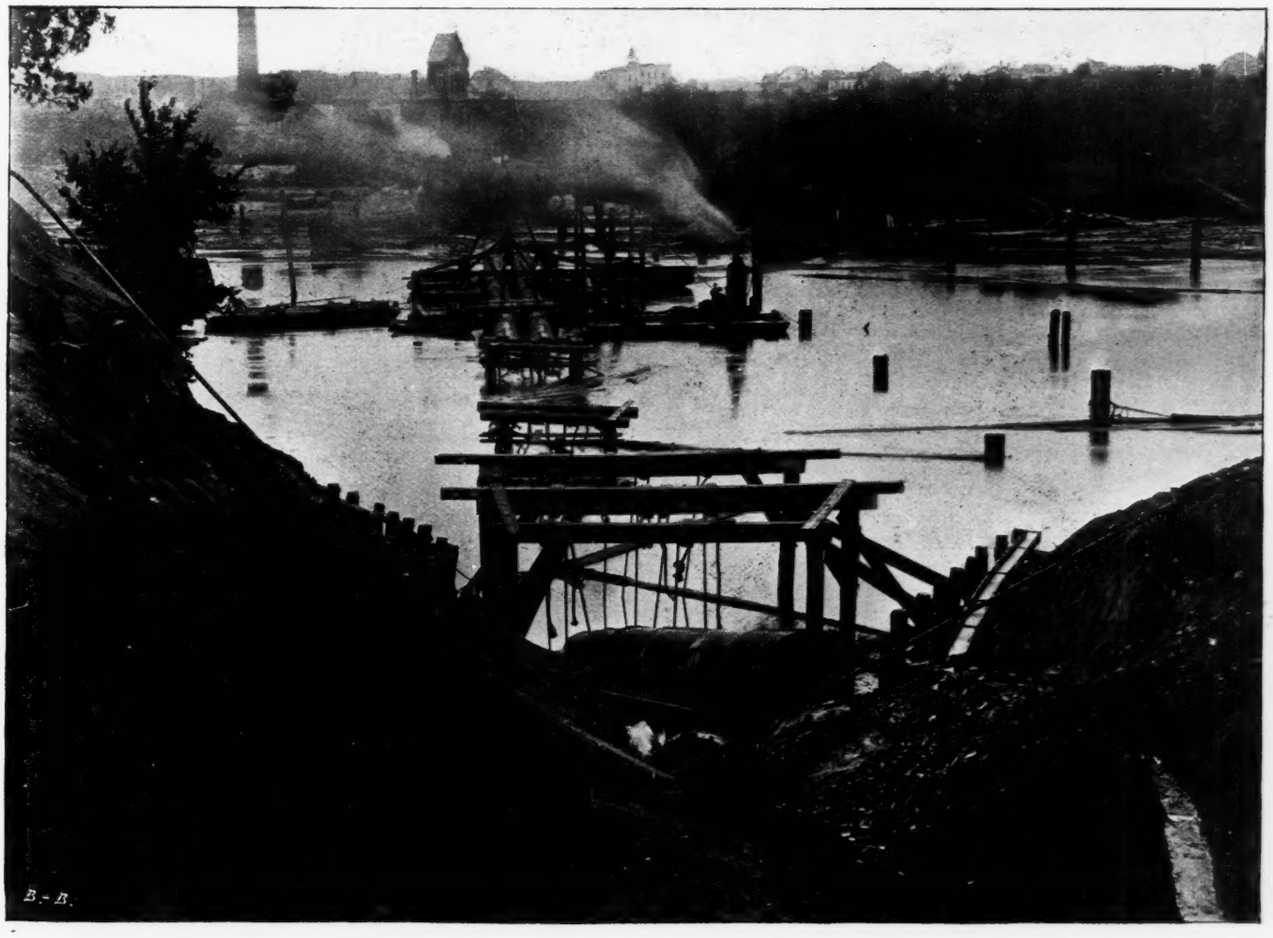
[Entered as Second-Class Matter at the New York, N Y., Post Office, August 12, 1896.]

VOL. 4. No. 4. NEW YORK, APRIL, 1898. $3 A YEAR.

PAVING, PIPE COATING AND SANITARY IMPROVEMENTS.

F. W. Cappelen, of Minneapolis, is one of the best known and most competent city civil engineers in the United States, and his annual report of 1897, just published and containing much more information of general interest than is usually found in such documents, is a work of considerable value to the engineering profession and all citizens interested in public improvements. Paving is the first subject dealt with in Mr. Cappelen's admirable report, and under this heading we find a detailed statement of the first experience of Minneapolis in constructing a brick pavement by day labor. This pavement was laid on Seventh street south, and out of five different kinds, the Purington Galesburg brick, with a ten-year guarantee, was selected as the best for the work. The brick were laid on a six-inch concrete foundation, Murphy grout was used for filling and a one-half inch expansion joint extending across the roadway from curb to curb, consisting of California asphalt and maltha, was placed about every 150 feet. The minimum paid for labor was $1.75 per day. The detail cost of the work was as follows:

Removing old pavement	$0.035	per	sq.	yd.
Grading	0.032	"	"	"
Concrete	0.467	"	"	"
Planking, lumber and miscellaneous.	0.008	"	"	"
Brick	0.870	"	"	"
Hauling	0.038	"	"	"
Cushion	0.018	"	"	"
Laying brick	0.032	"	"	"
Murphy grout	0.175	"	"	"
Total	$1.675			



MINNEAPOLIS RESERVOIR PIPE LINES—RIVER CROSSING TEMPORARY ANCHORAGE EAST SIDE.

This price of $1.675 per square yard was 31½ cents below the lowest bid made by contractors for such work. The pavement seems to be thoroughly satisfactory to the abutting property owners and the public at large.

Referring to repairs to asphalt streets, the report says: "I consider the principal cause of the year's repairs was the excessive and unnecessary and not justifiable street sprinkling. Considerable judgment should be used, and it seems to me that ordinary intelligence would be sufficient to handle this matter. I have endeavored to have the evil remedied, but not very successfully, because

I have not direct control of this particular work. By closely scrutinizing Table No. 50 on sprinkling, it will be seen that the Eighth ward sprinkles more feet per team than any other ward. The Fourth ward sprinkles a less number of feet per team than any other ward and uses, with the exception of the Sixth ward, considerable more water, and it is in the Fourth ward that the most asphalt repairing has been done; of course, it is admitted that this ward has more asphalt than any other ward.

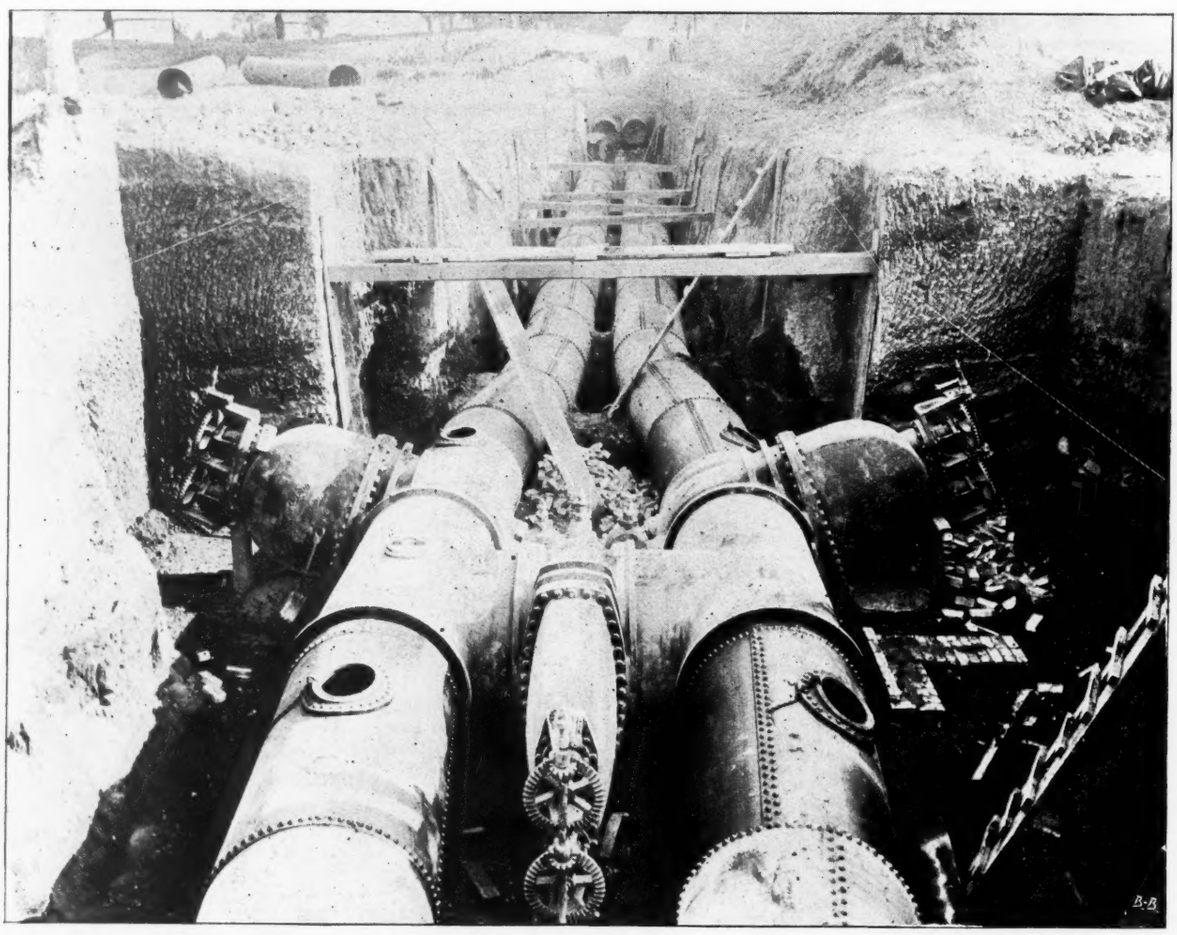
"There was used for street sprinkling during the year:

By the city proper.....	366,530,361	gallons of water
By the park board.....	12,000,000	" " "
For flushing asphalt streets	3,000,000	" " "
Total.....	381,530,361	" " "

"Which at meter rate of eight cents per 1,000 gallons, amounts to $30,522 in round numbers. Although this water is furnished free by the city, it is certainly plain, however, that, taking into consideration that the other sprinkling expense amounts to $105,684.97, there is room for mprovement and economy. Most of the present street sprinklers are old and out of date.

"In connection with the asphalt paving repairs I would say that during the year considerable trouble was experienced in getting the repairs promptly done and attended to. The companies were properly notified to make repairs at various times, but although the specifications say that if repairs are not made within six days after notification the city may cause the repairs to be made by anybody, the companies did not comply for several weeks and the condition of the streets grew correspondingly worse. The companies were paving in other cities and simply did not arrive until it suited their convenience, meanwhile the city had to wait. Commencing suit would not do much good. Inviting other companies to come would be out of the question, so all we could do was to grin and bear it. It therefore occurred to me that it would be worth considering the idea of having a municipal asphalt plant. Asphalt can now be bought in open market without trouble and at fair prices, and asphalt standard pavements can be laid in Minneapolis for $1.60 per square yard, paying 5 per cent. interest on an invested capital in plant and tools of $20,000. The city would of course have to take the risk of maintenance, but I cannot see why it is not just as able to do so as a contractor, and the city would certainly be able to promptly make all necessary repairs without unnecessary and disagreeable delays."

Mr. Cappelen notes the fact that through individual subscriptions enough money was raised to build 586 miles of bicycle paths during the season, and recommends using some of the public funds for this work in the future.



MINNEAPOLIS RESERVOIR PIPE LINES—BY PASS AT CENTRAL AND 37TH AVENUES N. E.

The most important improvement of the year was the construction of reservoir pipe lines for the water supply system. The contract for this work amounted to $343,726, and was awarded to the T. A. Gillespie Co., of Pittsburg. Mr. Cappelen describes the work in detail and publishes fourteen excellent half-tone cuts to illustrate the same. Some of these cuts are reprinted in this issue of CITY GOVERNMENT. A matter of general interest in connection with this improvement is the report of the pipe coating tests. Five different materials were used in these tests:

No. 1 Mineral rubber asphalt from Utah, manufac-

tured by the Assyrian Asphalt Co., of Chicago.

No. 2 Trinidad asphalt, mixed with dead oil, used by the Hugo Iron Works of Duluth, Minn., for the new 42-inch steel pipe line in Duluth.

No. 3. California asphalt, from the Waldorf mines.

No. 4. California asphalt, same as above, mixed with about 40 per cent. of maltha.

No. 5. Pipe dip from the works of Dennis Long & Co., of Louisville, Ky.

To do the dipping test an oven was built of brick, and two 8-inch iron pipes bricked in so as not to be exposed on their inside to any smoke or flame. Into these pipes 4-inch pipes were placed to be heated to the desired temperature. These pipes were thoroughly cleaned by pickling in diluted acid before heating. The coating material was heated simultaneously, and when pipe and coating had the desired temperature, the dipping of the pipe in vertical position was done; some pipes were dipped once, some dipped twice, the second dip being made quickly after the first, and thereafter the dipped pipe was either placed in ice water and allowed to cool therein, or was cooled without being put in water. After cooling, the coating was subjected to blows from a hammer to test the elasticity of the material. The following dip tests were thus made with

MINERAL RUBBER COATING.

Test.	Temp. of Pipe. Deg. F.	Temp. of Coating. Deg. F.	Pipe Dipped
No. 1	400	400	Twice, then put in ice water
No. 2	400	400	Once, then " "
No. 3	300	300	Twice, then " "
No. 4	300	300	Once, not " "

Coating covered pipe splendidly in all cases and somewhat thicker for the 300 deg. temperature and stood hammer test perfectly. The material is so elastic that, by cutting into the coating and entirely removing some of it, the opening can be covered by simply hammering the edges around the space so that it is impossible to see the joint. The coating did not foam even up to a temperature of 700 deg. F.

TRINIDAD ASPHALT MIXTURE COATING.

Test.	Temp. of Pipe. Deg. F.	Temp. of Coating. Deg. F.	Pipe Dipped
No 5	300	300	Twice, then put in ice water
No. 6	300	300	Once, then " "
No. 7	300	300	Twice, not " "
No. 8	300	300	Once, not " "

MINNEAPOLIS RESERVOIR PIPE LINES—MAIN BOULEVARD LOOKING NORTH.

The coating remained sticky after coating, in all cases, evidently due to the deal oil. The hammer test was made some days later, showing some slight flaking, but at the same time indicating considerable elasticity. That the coating loses its stickiness must be due to evaporation of the dead oil. The mixture when heated foamed considerably, evidently due to presence of dead oil and moisture.

CALIFORNIA ASPHALT COATING.

Test.	Temp. of Pipe. Deg. F.	Temp. of Coating. Deg. F.	Pipe Dipped
No. 9	350	350	Twice, then put in ice water
No. 10	350	350	Once, then " "
No. 11	350	350	Once, not " "

Coating was very nice, but flaked badly for hammer test in all cases.

CALIFORNIA AND MALTHA MIXTURE COATING.

Test.	Temp. of Pipe. Deg. F.	Temp. of Coating. Deg. F.	Pipe Dipped
No. 12	300	400	Twice, then put in ice water
No. 13	300	400	Once, then " "
No. 14	300	400	Twice, not " "

This coating was very nice, but flaked slightly in all cases. Mr. Cappelen made this mixture himself, having had some experience with the two materials constituting the same. The high percentage of maltha is required to overcome the brittleness of the asphalt.

DENNIS LONG PIPE DIP.

Test.	Temp. of Pipe. Deg. F.	Temp. of Coating. Deg. F.	Pipe Dipped
No. 15	300	300	Twice, then put in ice water
No. 16	300	300	Once, then " "
No. 17	300	300	Once, not " "

Did not stand the hammer test. Coating when hot foamed considerably.

In all cases, but particularly where the coating flaked off, a thin secondary coating could be seen next to the pipe. This same condition was found to exist on some of the New Jersey Water Company's 48-inch steel pipe for the Newark supply, when it was uncovered last year. Mr. Sherred, the engineer in charge of the water department of the city of Newark, N. J., considered this secondary coating to be combination of sesque-oxide of iron with proto-oxide, or what would be chemically equivalent to $Fe_2O_3+FeO=Fe_3O_4$, a more stable compound which would prevent further oxidization, and is probably due to some chemical action which takes place when the hot pipe is dipped in the asphalt bath. Where nothing but this coating was found on the Jersey pipe line no further oxidization was discovered.

Some twenty iron plates, about $\frac{1}{8}$ inch thick and 6 inches square, were treated in a similar manner as the pipes, with the same result. Tests were then made with various acids to see the effect upon the coating on the plates, with the following result:

The mineral rubber coating was not affected by muriatic acid (HCL), nitric acid (H NO_3), nor by a sulphuric acid (H_2SO_4).

The Trinidad coating was not affected by HCL, but was affected by H NO_3 and H_2SO_4.

The California and maltha coating was affected slightly by HCL, but very perceptibly by H NO_3 and H_2SO_4.

The California straight coating was not affected by HCL, but was affected by H NO_3 and H_2SO_4.

The Dennis Long coating was affected by all three acids.

Finally, the three best coatings were analyzed, with the following results:

	Mineral Rubber. Per Cent.	California and Maltha. Per Cent.	Trinidad. Per Cent.
Petrolene (soluble in petroleum ether).	75.71	70.66	43.08
Asphaltene (soluble in boiling turpentine and chloroform)	23.59	12.35	14.67
Total bitumen	99.30	83.01	57.75
Coke and organic matter not bitumen.	0.49	2.61	21.58
Ash (mineral matter)	0.21	11.95	1.05
Moisture and volatile at 100° C.	....	2.43	19.62
	100.00	100.00	100.00
Specific gravity	0.97	1.13	1.20

The analysis of the Trinidad mixture was very tedious and required several days' time. It was repeated to make sure of the result, which is correct as above.

Judging from these various tests, Mr. Cappelen was convinced that the mineral rubber coating is the best, and, judging from other information at hand, it is probably the best coating ever put on the market, not barring the so-called Sabin Jappanning process.

A particularly valuable feature of Mr. Cappelen's report is a line chart showing the relations between rainfall, sanitary improvements and typhoid fever in Minneapolis from 1870 to 1897. To prepare this chart must have been an arduous task, involving much research. The chart shows that before the improvement of the water supply by taking water also from the North side station, four miles above the so-called lower stations, and by the extension of the sewer system, the typhoid seems to increase with increased rainfall. After the improvements above referred to were made the typhoid relation to the rainfall reverses. This can be explained by the fact that the sewers carry off a great deal of filth which otherwise would have been washed into the river. One important fact is shown by the chart—that the improvements have certainly stopped the violent fluctuations of typhoid and kept the death rate since 1888 down below the average for 27 years. However, Mr. Cappelen states that filtration of water is necessary to bring the typhoid death rate below the danger line, viz.: 30 per 100,000 population.

Three large maps of Minneapolis, showing the paved streets, sewers and water mains, respectively, accompany the report. Detailed statements of the extent and cost of all public improvements are given, and, taken altogether, the report is one that should be most thankfully received by the citizens of Minneapolis in particular and the engineering profession in general.

INSPECTED THE WATERSHED.

On April 1 and 2 a large party of Jersey City officials and business men were taken on a special Pullman car and by carriages over the extensive watershed from which the George B. Inman Contracting Co. propose to draw of a water supply for Jersey City. There were in the party Mayor Hoos, Director Devitt, of the board of education; ex-Finance Commissioner John Edelstein, James F. Norton, Finance Commissioners Midlige and Simpson, Garwood Ferris, John J. Krever, F. W. Kalbfleisch, ex-Judge Henry Puster, F. E. Strome, Dr. Ulamor Allen, M. W. Baker, Aldermen Vermilye and Bornemann, Assemblyman Adolph Walter, Lebbeus B. Ward, Counsellor Charles Peshall, Michael J. Dady, Charles Cretin, Colonel A. B. Palmer, George Schley, Lawrence Broderick, E. B. Broderick, James Collins, George W. Ware, F. Gansberg, Harry Cox, Street and Water Commissioners Brown, Hauck, Boltwood, Heintze and Nolan, Myron Furst, Joseph A. Dear, Charles Shaw, Dr. Albanesius, Colonel E. L. Hunt, George Frick, George L. Robinson, Dr. Quimby, Captain Conroy, Chauncey Holt, William Reardon, Horace Farrier, George T. Brackett and Jacob Ringle.

The two-days' outing was made most enjoyable by the party's host, Colonel Inman, and every opportunity was given for inspecting the watershed, from which it is possible to gather an unlimited supply of pure water for the city. A full description of the Inman company's plans was published in the last issue of CITY GOVERNMENT.

—The new building ordinance of the city of Chicago limits the height of buildings to 130 feet.

—The street sweepers at St. Paul, Minn., will be required to wear white duck uniforms hereafter.

MUNICIPAL LIGHT PLANTS.

BY M. J. FRANCISCO.

Numerous articles have appeared in CITY GOVERNMENT favoring municipal ownership, and tables have been given showing (as was claimed) the cost of street lights. Permit me to call attention to the record of municipal plants, as shown by the report, just published (March, 1898), of the Gas and Electric Light Commissioners of Massachusetts, the only state in the Union which has a board that compels all electric companies to report their business in detail. These commissioners state that "during the past year all these plants have been visited by the board, their accounts and all data obtainable from the various town officers carefully scrutinized, with the active assistance and co-operation of the local managers and accountants." The board give on page 57 of their report an itemized statement of the expenses of all the municipal plants in the state, the total amount of such expenses being $122,261.88 for the year. Deducting from these expenses the total receipts, as given in this report, for commercial arc, incandescent and domestic lights, electric power, meters and all other sources, amounting to $52,106.10, it leaves a balance of expense over receipts of $70,155.78 for the vear as operating expenses. To this the commissioners add the interest on bonds and notes outstanding, as found by the books of the various plants, amounting to $25,955.88, and for depreciation, $39,777.15; also losses on jobbing, $273.64, making the net cost to these municipalities $136,162.45 per year. They operate 985 arc lights of 1,200 candle power and 2,175 incandescents averaging 27 candle power per lamp; converting these incandescents into arcs we have 48 arcs of 1,200 candle power, making total number of street lamps used 1,033. Therefore, the yearly cost of 1,033 arc lights being $136,162.45, it shows the average cost per lamp to be $131.81 per year, burning on an average only 6.3 hours per night, 26 nights per month and costing .067 per hour; furnishing 179 candle power per hour for one cent. This is the average and includes every municipal plant in Massachusetts. The above figures are official and have been verified by the Gas and Electric Light Commissioners after a personal examination of the books of each plant.

In this report depreciation was made 5 per cent. because that is the rate mentioned in the Municipal Ownership act. The commissioners do not endorse this per cent. as their opinion of what it should be, but simply use the per cent. named in the bill which became a law. If the depreciation was calculated even at 5 per cent. on the whole property it would add $6.69 to the cost of each lamp. As it is claimed by the advocates of municipal ownership that it is not necessary to calculate depreciation, I quote the opinion of the chairman of the Board of Gas and Electric Light Commissioners. He says depreciation "is certainly a part of the cost of operation as much as either coal or labor, but it is one that is often overlooked, not only by the municipal authorities, but by the companies. Depreciation should not only account for the actual deterioration of the apparatus due to its use, but should include the reduction in the market price of the apparatus, and the loss upon apparatus which becomes commercially useless through the progress of the art, as well as those appliances which may become valueless, not because they are worn out or out of date, but because the growth of the business in that particular locality makes it no longer economical to use them, and although in condition to do the work for which they were originally designed, nevertheless become practically useless through the necessity for a reconstruction or rearrangement of the works to meet new conditions." The writer, after twelve years of practical experience operating an electrical plant, claims that 10 per cent. on the entire investment will not any more than cover the depreciation, but in order to give a rate that all experienced electric light men would pronounce low, in the work just published of "Municipal Ownership versus Private Corporations," 8 per cent. was adopted in every case, unless there was some special reason for varying it in the case of certain plants. The records and experience of all electric plants that have been operated for ten years prove that with the march of improvement and the progress made in inventions that all enterprises of this nature must be based upon this rate of depreciation if a financial success is expected.

On page 56 of the Massachusetts report is shown the total investment of these plants, amounting to $933,784. Therefore, it will be seen that the interest was not calculated upon the investment, but only upon the balance of bonds and notes outstanding. If interest was based upon the total investment, it would add $11.03 to the cost of each lamp. The position taken by the advocates of municipal ownership upon the question of interest is very strange. It is that interest upon the investment should not be considered when estimating the cost of a municipal plant. It is certain that if the tax levied to install a plant had not been raised, each taxpayer would have saved or retained the proportion which he was called upon to furnish as his share of the enterprise; then why are not the taxpayers in a sense stockholders in this municipal industry? The city authorities compel them to contribute $200,000 to build a plant. This plant gives no return to the city except the light it produces. In the meantime they levy another tax to secure money for the operating expenses. Suppose instead of putting the $200,000 into an electric light plant they had loaned it upon a good mortgage or purchased government bonds, would not the interest on this money be paid into the city treasury every year and thus yield an income that could be used for city expenses and reduce the amount that would have to be raised by taxation? Therefore, every taxpayer would receive his proportion of the interest and his tax would be that much less. Besides, with this money at interest, the investment would be good for its face and could be called in at any time, but when it is invested in an electric plant the property is wearing out all the time, and at the expiration of a few years is worthless and the city has nothing to show for its investment.

In order to give a fair comparison between the cost as furnished by a private corporation and a municipal plant, we must add these items as enumerated above to the cost as shown by the commissioners' report, which makes the cost of the lights under municipal control $165.15 per lamp, per year, using only a 1,200 candle-power lamp. Hyde Park, Chelsea, Boston, Springfield, Westfield, Haverhill and Worcester, all Massachusetts cities, are furnished on an average 1,771 candle-power arc lights, under contract, burning on an average eight hours per night, twenty-nine nights per month, at an average cost of $102.98 per lamp, per year, costing .034 per hour and furnishing 513 candle-power per hour for one cent. This shows the fallacy of the claims made by the advocates of municipal ownership and proves conclusively, by the statement of the state officials, who thoroughly understand their business (and who have personally examined the books of each plant and compared the figures), that the cost of lights as given in reports which have been sent out by the municipal ownership advocates were not correct and did not give the true cost to the municipalities of the lights. There is another feature of the business disclosed by the report of these commissioners. The total investment of all the municipal plants in Massachusetts amounts to $933,774, and their assets now, by the inventories furnished to the commissioners, amount to only $900,816.79, while their liabilities are $987,184.71,

showing a deficiency of $86,367.92, which has not been included in the cost of lights, but is a part of the loss to the taxpayers of Massachusetts, caused by the plan of municipal ownership. Will our friends who are advocating this system please specify how the taxpayers of Massachusetts have been benefited by municipal ownership?

INFORMATION ABOUT WATER WORKS.

Very nearly everything one cares to know about the water works interests of the United States and Canada is contained in the "Manual of American Water Works," edited by M. N. Baker and published by the Engineering News Publishing Company, of New York. This remarkably complete book contains historical, descriptive and financial statements of 3,341 water works plants. Each plant is treated separately and thoroughly, and all facts relating to it that can be considered of any importance to the ordinary student or investigator are given. Of the 3,341 plants mentioned, 1,799 are owned by the municipalities, 1,524 are owned by private parties, and the ownership of the remaining eighteen is not stated. Of the fifty largest cities in the United States, only nine are dependent upon private companies for their water supply, viz.: San Francisco, New Orleans, Omaha, Denver, Indianapolis, New Haven, Paterson, Scranton and Memphis. Regarding the use of meters the "Manual" says:

"In the introduction to the 'Manual' for 1890-1 some figures were brought together showing very conclusively that the cities having low water consumption per capita had, quite generally, a large percentage of their taps metered, and also that high consumption commonly prevailed where the contrary was true. Great care has been taken to ascertain for the 1897 'Manual' the general conditions governing the use of meters, as well as the extent of their use. It appears from the reports received that the meter is growing in favor, both with water officials and consumers. Some cities and private companies still restrict the use of meters by requiring large deposits or rentals for their use and high rates for the water consumed, but others go so far contrary as to provide meters without cost to the consumer, at the same time making a low price for the water passing through them. Quite a number of works, including some small ones, have adopted the full meter system of late, and many others are moving as rapidly as possible in that direction. The initial step is generally the metering of a few of the largest consumers, proceeding from this to the general adoption of meters for all but domestic consumers, and making meters possible even for these and other small water takers. There seems to be a common agreement among water works officials that, whoever may own the meter, it is essential that the water department should control it, and also that it is not the liberal use, but the absolutely useless waste of water that is being fought, and which meters operate to check."

On the important subject of water purification, the editor of the "Manual" writes as follows:

"Five years have seen a wonderful increase in the popular demand for pure water. This has been secured in many instances by providing entirely new and naturally satisfactory sources of supply, and in others by some method of water purification. Mechanical filters were introduced some twelve or fifteen years ago, and slow sand filtration has been in use at a few places in this country for many years. But within the past five to seven years each process has been coming rapidly to the front, until in the present 'Manual' over one hundred mechanical filtration plants are listed, and perhaps ten or twelve filter-bed systems operated in accordance with the recent flood of light on the subject. While much is claimed for the bacterial efficiency of mechanical filters, the fact remains that the claims are not yet so firmly verified by scientific research as are those of slow sand filtration. The elaborate experiments at Providence tend to greatly increase confidence in the bacterial efficiency of the process, and all interested in the subject are eagerly awaiting the results of the yet more exhaustive Louisville experiments, on a water of an altogether different character, carried on with a variety of makes of filters, all sufficiently large to make them, in point of size, comparable with filters in regular use. There is no doubt but what both mechanical and slow sand filtration have a great future in this country, and that with the aid of one or the other pure water for all is a possibility."

The closing paragraph of the "Introduction" of the work says:

"In closing this review of some of the most notable tendencies in water works practice, a word should be said regarding the beneficial effect upon these undertakings which must result from the recent interest taken in the reform of municipal government. While many a familiar name still on the list of officials attests the fact that in many cities a faithful and efficient water works superintendent or secretary is appreciated, there are more changes than can be accounted for merely by natural causes, or removals for the good of the service alone. If any public servant becomes valuable with increased years and experience, it is the man responsible for the operation of a water works plant. It is certainly to be hoped that with better municipal government there may come a change in the policy which is still followed in too many cities of making a change in the water supply department heads with every change in the dominant faction in municipal politics; and that instead we may everywhere see the man who discharges his duties faithfully and well retained in his position year after year, so long as his meritorious service continues."

An important feature of the "Manual" is the statement showing the water rates, by fixtures and meters, in over 1,250 cities and towns. The price of the book is $3, and it is worth many times that amount to any one who is interested in the subject it treats so thoroughly.

STREET CLEANING IN CHICAGO.

Last month the city of Chicago put in operation the new plan of doing its own street cleaning. Five hundred civil service laborers were put on the work, and a number of sweeping machines were hired by the city. The plan is to send the machines over the streets, and to follow them with laborers with shovels and brooms. The refuse will be scooped up and carted away at once, and Commissioner McGann is confident that the new arrangement will give Chicago better results than have ever before been attained under the old system of letting out the work to contractors.

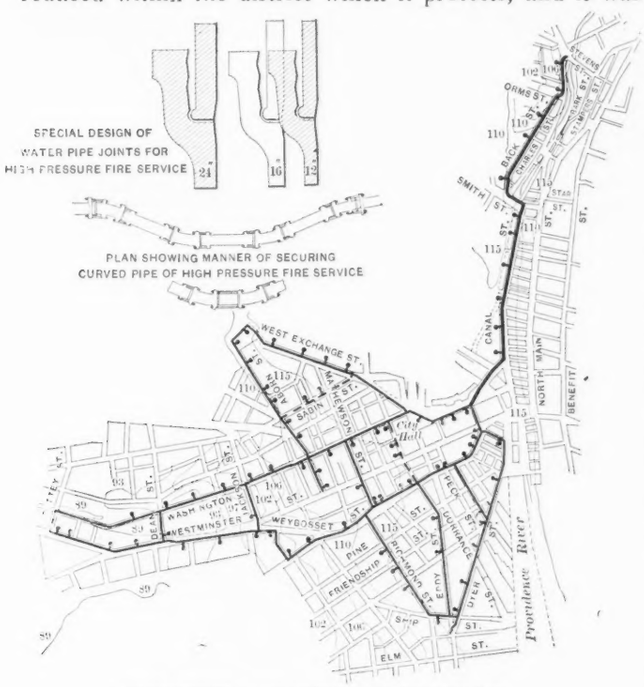
"By the plan which we are putting in operation," said Commissioner McGann, "there will not be a square inch in the streets and alleys of Chicago for the cleanliness of which some employe will not be directly responsible. By dividing the city into sections and putting one man in charge of all the work in a certain section it will be an easy thing to bring matters to a focus. When a complaint comes in we will have some one directly responsible to the city to refer it to and to see that the cause is removed. There will no longer be any chance for the time-worn excuse that the contractors are negligent. If there is any negligence in the future it must be that of a city employe, and that will not be tolerated by this department."

Attend the Detroit Convention.

NEW HIGH PRESSURE FIRE SERVICE SYSTEM AT PROVIDENCE, R. I.

Providence, R. I., has generally been supposed, on account of the large size of its water distribution pipe and the abundance of its water supply, to be well protected against fire. An independent high pressure fire service system, however, has been recently installed there, consisting of very large pipe, which is not to be used for any purpose but fire protection, and no connections of any kind whatever, except those of the hydrants of the service, are connected to the pipe of the system. The average static pressure in the mains of the new fire service system is about 44 pounds more than it is in the pipes of the low service at the same elevation.

The high pressure fire service system was completed last October, and is seems to give great satisfaction to all concerned. The insurance rates have been considerably reduced within the district which it protects, and it was



PROVIDENCE HIGH PRESSURE FIRE SERVICE.

The irregular lines show, in pounds per square inch, (at the surface of the ground along which they run) the approximate static pressure of Fruit Hill Reservoir.

demonstrated at a large fire last December, in the opinion of the fire commissioners and others, that it practically paid for itself during this fire, as the conflagration was kept within the walls of the building in which it originated by the aid of the new fire service; otherwise, it might have spread over a large area and caused a great additional loss of property.

The area of the new fire service district, which is principally located in the center of the business portion of the city, is about one-half of one square mile. The supply of water is taken from the Fruit Hill high service reservoir 24-inch main, at a point a little more than three miles from the reservoir, the water line of which is 274.75 feet above datum. The total length of the pipe of the high pressure fire system is 29,409 feet, namely: 4,189 feet of 24-inch pipe, 23,004 feet of 16-inch pipe, and 2,216 feet of 12-inch pipe. To this pipe are connected eighty-nine hydrants.

The static pressure at the hydrants ranges from 116 to eighty-five pounds per square inch, according to the location of the hydrants. The pipe is of such large size that under ordinary conditions the pressure will not fall below 100 pounds per square inch in the center of the business portion of the city, when an average rate of 5,000,000 gallons per 24 hours, or 3,472 gallons per minute, is being drawn from the pipe. Arrangements have also been made so that in the future, if it should be desired, a stationary pumping plant can be connected to the pipe of the fire system and the pressure raised fifty pounds more per square inch than the pressure is at the present time.

At a test in the center of the business portion of the city, soon after the system was completed, a stream of water was discharged from a 2½-inch ring nozzle to a vertical height of about 137 feet, while the water was flowing at the rate of about 950 gallons per minute.

The total cost of the system was about $139,749, or about $4.75 per lineal foot. The pipe was laid 6.25 feet deep, which is about 1.6 feet deeper than the depth of the ordinary water pipe, in order to pass under the water pipe and other obstructions that were already in the ground, as well as a precaution against the freezing of the water in the pipe of the fire system, which would be more likely to occur on account of its comparative stagnation. As an additional safeguard against freezing, a by-pass has been located between the fire service system and the low service, and three blow-offs are connected at convenient points. For more than four months during the past winter the gate of the by-pass into the low service has been opened a few turns, allowing a discharge of about 40,000 gallons per twenty-four hours into the low service, and every morning, during the same period, two blow-offs have been opened about fifteen minutes, allowing a discharge of about 1,100 gallons in addition to that passing through the by-pass. The circulation in the fire system produced by these discharges has prevented the minimum temperature of the water from falling below 37° during the winter.

The expense of laying the pipe was considerable on account of its being principally laid in paved or macadamized streets, on account of its unusual depth, which necessitated generally the sheeting of the trench in which the pipe was laid; and in some cases, very bad quicksand was encountered, which necessitated the dumping of coarse gravel into the bottom of the trench in order to secure a satisfactory foundation for the pipe.

The plan published herewith shows the pipe as laid in the high pressure fire service district and the hydrants connected to the pipe. As will be seen by the plan, the static pressure at eighty per cent. of the hydrants is more than 100 pounds. This plan does not show, however, the pipes and hydrants of the low service, which are laid in all of the streets shown upon the plan. The plan also shows a section of the pipe joints, which have a double groove for increasing the resistance of the lead which was used for calking the joints. These joints were especially designed for the fire service pipe. The method followed in securing the curved pipe of the system having an angle or more than ten degrees is also shown. As will be seen from the plan, collars, lugs and screw bolts were used. This method of securing the curved pipe, which was also especially designed for the fire service system, has given great satisfaction, both on account of the quickness with which the work could be done and the security of the same after it was completed.

It should be remembered, as has already been mentioned, that in designing and doing the work a much larger increase of pressure was anticipated in the future. An increase of pressure, however, is not probable, for at least some time to come, as the pressure at the present time is eminently satisfactory to the fire department.

The special designs mentioned above for the system were made under the personal direction of Mr. Edmund B. Weston, M. Am. Soc. C. E., engineer in charge of the Providence water department, who also directed the construction work. The loss of head due to the friction of the water flowing in the pipe, which was based upon what

it will be after the pipe has been ten years in service, was computed by a new formula, dependent upon the age of the pipe, which was constructed by Mr. Weston.

ILLUSTRATED LESSONS IN PUBLIC SCHOOLS.

The object of education is good citizenship. The age is commercial and this is an industrial country, yet commercial education in the United States is narrow compared with that of Europe. Industrial education here is just beginnning. Manual training schools are few in number and limited as to resource. Free drawing schools comprise almost the only industrial education offered to evening students, yet training offered in our large manufacturing concerns is becoming more and more limited, so that the boy set early to work becomes acquainted with but one set of tools or one machine or line of work. He himself becomes merely a machine. He can command work at nothing else. Thus industrial ignorance is becoming the cause of the despair, recklessness and violence which too often characterizes masses of workingmen. Industrial education is the remedy for this. From the ages of eight to fourteen years it should be universal. It is the best security of taxpayers.

Industrial education is not the training of the hands only, but of the perception as well. We can see only what we have been trained to see. The presenting of a picture to the eye of a child then, is not a mere matter of amusement, but involves one of the most important means of development and education. "The moment anything attracts or interests us," says W. T. Harris, commissioner of education, "that moment it is already apperceived." And this idea of "apperception" is the most important fruit thus far developed by the study of the psychology of pedagogies. It is much easier to train the perceptive faculties of a child by pleasant means, by attractive and interesting methods, than by years of dry statement of fact in words, unaccompanied by other presentation. It is logical, therefore, that the use of the stereopticon, accompanied by lecture and description, should become one of the chief of educational factors.

The creative or constructive power is strong in the human race; we find the child tears in pieces his playthings that he may see how they are made, and then, later, endeavors to rebuild or to make new combinations. For this he is often punished and the faculty restricted. Instead, the instinct should be diverted into proper activities, and the new education now endeavors to attain this end, at the first by kindergarten methods.

But quite as important as the development of this creative faculty is that of seeing things aright. To the eyes of a child objects are often conglomerate. He has not learned to separate, and hence makes wrong comparisons or sees things out of their proper proportion or relation. This, to a very great extent, can be corrected by picture presentation in the class room itself, where things can be shown in their right order and relationship. Or, he fails to perceive altogether the objects about him—lost, no doubt, in the multitude of things presented for his attention. Picture presentation can fasten his attention on that which is important and so fix the object on his mind that forever after he not only perceives that object in nature, but sees it in its right relationship to all about him. This picture education should not be limited to the presentation of the strange and wonderful. The teacher cannot always go with his pupils into the outer world, and hence has hitherto been restricted for the most part to word instruction only, or has left the child an utter stranger to the right understanding of the material world, which is the very foundation of industrial progress.

That the influence of structural forms and the development of observation is not great among ordinary school children, as trained at present, was clearly shown in a test recently given to about 2,100 children in New England. The children were asked to answer the question, "If you could visit some place, tell what place you would like most to visit and why you wish to visit that particular place?" Hardly one-tenth of the children examined indicated any interest in structural forms. It is quite likely that did structure receive the attention in the schools which is deserves, choice of such natural wonders as the mountains, Niagara Falls, the Mammoth Cave, etc., would have been more numerous. As it was, only 124 pupils made choice of structural forms, such as the country, the beach, the ocean and the mountains, and only 109 desired to see natural wonders, such as Yellowstone Park, Niagara Falls, etc. On the other hand, about 1,200 desired to visit large cities, and the reasons given indicated in most cases a craving for change and excitement.

Is it any wonder, therefore, that with those methods of teaching which develop the love of beauty and the perception of structural form neglected, the cities are becoming overcrowded receptacles for incapable, inefficient and unskilled thousands? The root of the matter is clearly perceptible in the minds of the thousands of children in the smaller cities and towns, who, even in childhood, are gaining the desire for excitement, for the whirlpool of existence found in the large cities.

A test of the same children in regard to occupations which they desired to follow developed the fact that 41 per cent. desired to follow a professional calling, although the fathers of but a very small number were professional men. That so few of the boys desired to be producers and so many of the girls showed a strong aversion to household duties of any kind cannot but be considered an unfavorable omen. Moreover, it clearly shows that in the minds of a very large number of our pupils, manual labor is regarded as something belittling. Clearly here is a fault in training, largely social and domestic, to be sure, but one which carries with it the very seed of disintegration and destruction to a great industrial country like the United States. Such a situation is truly a cause for alarm, but it can be remedied, though time is required for all educational processes. The teaching of the past has encouraged many false standards, and has unduly disregarded the training of the hands and the eyes of the child. Memory has been cultivated to the exclusion of the perceptive faculties. The cramming of other men's thoughts has been substituted for just appreciation of things. The child has been over stimulated to astound by his glibness and his acquirements in book learning, and thus an unnatural foundation in mental training has been laid. What wonder that the child grows to desire an artificial and non-productive life, and that the great masses of mankind strangely lack perceptive faculties, live in a world they do not know, and make use of facilities and agencies they do not understand.

We can hardly think that the children to whom the tests mentioned were applied had been taught the joy of productiveness, of the forming of useful objects, by the kindergarten methods, much less the perception of form and beauty of form and of the material world by even so simple and suggestive a method as that of picture projection by means of the stereopticon. The use of pictures cast upon screens by magic lanterns has become well known in the lecture hall, but its appearance in the school room is still a novelty. It is, however, only an advance step in making the child acquainted, not alone with its own little constructions, but with the great works of nature and of man, brought, as it were, into the school room before the very eyes of the child.

Such training should go hand and hand with school and manual training, and until industrial schools are more common no better method could be devised for awakening the child to the true perception of the world in which he lives.

FLUSHING SEWER SIPHONS.

The problem of how to successfully operate the sewer siphons has at last been solved. To Charles Muench is due the credit for removing this troublesome obstacle to the successful operation of the sewer system. When Mr. Miller, the patentee of a flush tank bearing his name, was in the city several months ago, he went before the sewer committee of the city council and suggested that the siphons could be made to work properly by putting in a large flush tank at each siphon. Mr. Muench was present at this meeting of the committee, and modestly suggested a better way would be to put in a gate above each siphon, which would dam up the water in the sewer till a sufficient volume had been accumulated to flush the siphon. He detailed his plan to Mayor Callaghan and received the mayor's permission to make a practical test of it.

The siphon selected by Mr. Muench for a test is the siphon on Aransas street, which has given the city more trouble than any other. Mr. Muench constructed a gate in the sewer at the manhole about 400 feet above the siphon. The bottom of the gate is made circular to fit the bottom of the sewer and is about 24 inches high. It swings on a horizontal bar across the sewer, and is designed so that when the water reaches a certain height the gate will open automatically and let the water that has been backed up behind it rush down the sewer.

The gate at the Aransas street siphon was completed several days ago, and has been subjected to a most rigid test. At the time of its first trial the scum on the water in the siphon manholes was over 14 inches thick and had amalgamated into a compact mass of filth. This crust of filth was broken up and a large portion of it carried through the siphon with one flushing. So great was the force of the water that pieces of refuse matter half as large as a man's body were forced through the siphon. A vast amount of sediment which had collected in the bottom of the siphon was also scoured out. As showing the scouring force of the flushing, a dust pan from one of the sewer manholes was some time ago dropped into the manhole above the siphon. As the water stands over ten feet deep in this siphon the dust pan was not recovered. After the first flushing by Mr. Muench's system this dust pan was forced through the siphon and up and through the sewer at the opposite side. The dust pan is of galvanized iron, with a perforated bottom, and is eighteen inches in diameter.

Not only does the system flush the siphons perfectly, but it is very inexpensive. It will cost less than $20 each to put in the gates. No additional water is required, as by this system the sewers are flushed with the sewage. Mr. Muench estimates that about 27,000 gallons of water can be accumulated behind the gate, which is a dozen times more than could be obtained by means of a flush tank. The largest flush tank suggested was to contain only 2,000 gallons of water, which would have come from the water mains. By Mr. Muench's system 27,000 gallons of water are utilized without taking any additional water from the mains. The flush tanks would have cost $700 or $800 each. Mr. Muench's gates will only cost about $18 or $20 each.—*Express*, San Antonio, Tex.

—The programme has been arranged for the tournament of the Iowa State Firemen's Association, to be held at Muscatine, June 14, 15, 16 and 17.

LIMITS OF MUNICIPAL FUNCTIONS.

BY WILLIAM WATTENBERG, NEW YORK.

The question of municipal ownership of property used for public purposes is being so much discussed that it has been thought well to set forth in condensed form a few principles involved in the exercise of municipal power. The following brief paper, without presuming to enter technical territory, may contain acceptable suggestions for laymen concerned in municipal government.

The exercise of municipal functions within either of the United States must necessarily be in harmony with the federal constitution. As provisions thereof cover such circumstances, for example, as the bearing of firearms and the coinage of money, municipal power is controlled correspondingly.

In determining the proper scope of municipal functions, the objects which inspired municipal community are decisive factors.

A man living in a state of isolation naturally defends his own physical safety and that of his family; he relies on his own vigilance and strength to protect what he deems to be his property; he adds to his possessions by his activity; he enjoys air, the light of day and the instinctive intelligence needful, when combined with labor, to supply him with food, clothing and medicinal material.

When men combine to form what finally becomes a municipal community, they do so with no thought of surrendering their essential natural privileges, but with the expectation of perpetuating them and of gaining additional comforts and benefits. In other words, municipal community is not a substitute for a former existence, but a concurrent supplementary condition, created by the participating individuals, by which they are individually relieved of divers burdens and obligations and put in command of various enlightened privileges, for which they will render to the community an equivalent or concession, such as taxes or a conformation to some accepted public standard of personal conduct. These are the central ideas by which municipal functions must be governed.

For example, as the individual did not surrender his right to secure self-sustenance and property by the channel of established commercial or industrial activity, his right to trade and to labor must not be abridged except to that extent which is required in order that the separate rights of all his fellows shall be equally sustained, and the common welfare of the community be made more substantial. Correspondingly, the municipality must avoid all acts partaking of barter and industrial production.

One of the first obligations transferred by the individual to the community is that of protecting life and property. It is therefore germane that the police and fire departments in any city should be among the primary creations of its official work.

It is also evident that close sanitary supervision is naturally one of the acquired municipal functions, for as various deadly diseases are contagious, a human being, on abandoning isolation, incurs much greater liability to disease unless sanitation in the community be constant.

WATER WORKS.

If it were clear that men living in isolation could always provide themselves with reasonably pure drinking water, the claim by a municipality that it has the paramount right to furnish a public water supply might logically be denied. But experience shows that where human beings are living isolated—in fact, even when they dwell in unsupplied suburbs of cities—their comparative disregard of sanitary laws results in the consumption of water unfit for human use, resulting frequently in contagious diseases, which imperil innocent persons at a distance. And

while private ownership of a public water supply system is not illegitimate, it is out of place, for the municipality alone is entitled to the general sanitary supervision of a city, and the water supply and public health are so intimately associated that their control should be coordinate. Sanitary control properly includes the regulation of the height of buildings.

PUBLIC GAS SUPPLY.

The supply of gas for lighting purposes is properly within the province of a municipality. It is true that men living isolated, or even in villages, can subsist without artificial light, and that in many hamlets, at least during a part of the year, the residents retire at such early hours that artificial light is not absolutely essential.

It might seem, therefore, that artificial light is something with which the municipality has nothing to do, as it constitutes a privilege which the isolated man did not have or require when he resigned his isolation for citizenship. Indeed, the "link-boy" system in London of the last century would serve to accentuate this view. But the reply is that in cities as now built and inhabited, including their places of assembly and amusement, artificial light is an absolute necessity, associated with new conditions which the municipality should control for the very reason that they are the result of its own existence. If the city had not been created, and its inhabitants were still scattered in isolated dwellings, artificial light could practically be dispensed with.

PUBLIC TRANSPORTATION.

Municipal ownership of systems of passenger conveyance is illogical. This may seem inconsistent with the legality of such ownership of water and gas works, but the fundamental conditions are diverse.

The question of artificial light seriously affects every dweller in a city, without distinction, radically and quite irremediably. It is not so with personal transportation. In a city a mile square, for instance, even a private system of public passenger transportation would be superfluous. If some of the denizens of a city four times as large elect to pursue their occupation in one quarter and to reside four miles distant, their choice is a personal matter, involving taste, preference or whim, and not one in connection with which the municipality should assume responsibility or expense. There is no more reason why the community should supply a citizen with a conveyance because he is not able to own a private equipage than there is why it should engage in selling carriages or bicycles to the opulent. Passenger transportation should be a private enterprise, resting on franchise rights secured from the municipality and satisfactorily paid for.

PUBLIC EDUCATION.

Systems having for their aims the maintenance and development of human intelligence are properly the subject of municipal control, for in order that the rights of individulas shall be respected and preserved and social disorder avoided, it is imperative that general standards of intelligence shall be nurtured to such a degree that the great majority of the citizens shall discern and regard both their duties and their rights.

If education were left to private institutions, only a minority of the people would acquire even primary knowledge, and the lapse of a few centuries would be competent to so change the quality of human mentality as to extinguish social institutions.

POST OFFICE CONTROL.

The delivery of mail matter is primarily a transaction in which private citizens can engage gratuitously or for compensation, and the habitual delivery of mail is a special service assumed by the federal government for the people of the various states by their consent, and not a service based on original natural jurisdiction.

Public policy requires that a labor so vast and employing so many thousands of persons shall be done by the government and not by private companies, for the eventual survivor of a number of competing companies making a business of the delivery of mail matter would necessarily be a monopolistic concern of such magnitude as to be a menace, in unprincipled hands, to the commonwealth's general welfare.

It is true, nevertheless, that in the event of federal suspension of mail service, the municipality is competent to undertake such service within its territory, or to entrust it to such of its private citizens as may be selected. As the area within which the latter would operate would be relatively insignificant, the considerations applying to mail service when rendered throughout the country by a single company lose their force.

PUBLIC THOROUGHFARES.

Antecedent circumstances enjoin that for the habitual use of streets, by corporations or persons, for systems of passenger transportation or similar purposes, material consideration should be exacted; and yet there is danger that too high a price may be required for such a franchise.

It has already been seen that the transportation of passengers is properly a subject of private enterprise. But if carriers of freight within the city are required only to pay some trifling license tax, why should not carriers of human beings secure on equally liberal terms passage for their cars or vehicles?

It is clear that the construction and maintenance of a city railway is more of an obstruction than the less studied locomotion of a hack; but the managers of the railway may well point out that by concentrating within the walls of their cars a considerable part of the human travel of the town, they relieve other portions of the same or other thoroughfares, leaving them generally more free for the unimpeded passage of vehicles and pedestrians.

The power of a municipality to grant to private corporations or persons the right to build bridges across streams or tunnels beneath them, or to create other subterranean thoroughfares in order to provide channels for the transportation for hire of passengers and freight should be absolute, provided that a sufficient indemnity be furnished to the municipality protecting it against suits for damages brought by citizens whose rights as owners or tenants of real property have suffered loss, as, for instance, through the sinking of a warehouse owing to unskillful tunneling.

In cases of extreme congestion of traffic, the municipality is even competent to provide a subterranean passage or an elevated viaduct at public cost, for a public thoroughfare may properly be beneath or above the surface of the ground as well as at the surface. A thoroughfare at the level of the surface simply represents the most primitive form of highway.

TAXATION.

The municipality should seek to raise the revenue necessary to meet its expenditures from improved real property so far as possible, and vacant land in a city should be free from tax. License charges and taxes upon occupations or industrial enterprises should be nominal if imposed at all, and a reasonable limit, by a prescribed maximum percentage of the total assessed value of the tax-paying property within a city, should be maintained as regards debts incurred by the municipality.

LIBERTY OF INDIVIDUALS.

While the individual, on becoming a municipal citizen, retained the essential rights possessed while living in a state of isolation, it is obvious that his habits and deportment are affected by the change, and that they must conform to any standard concurrently adopted by his fellows.

For example: while isolated he may, if he chooses, sing boisterously at all hours of the night; he may also imbibe inordinate quantities of intoxicating liquor, and as long as he remains isolated it is no one's right or duty to check or punish him except on the ground of personal consideration or interest. In his new state, however, the general welfare of his fellows, hundreds of whom may be deprived of their sleep by his singing or disorder, calls for interference with his acts if persisted in, and public policy demands that a deterrent penalty in some form shall be imposed upon the offender by municipal authority.

The habits and mode of life of the individual are not to be restricted, however, except when—as in the case of the boisterous drunkard—they interfere with public welfare or the rights of others. Neither the municipal community or the state can lawfully say to the individual, "You shall drink no wine," any more than it can lawfully say, "You shall eat no hot biscuit or underdone bread."

Nor has it the right to say, "You shall drink wine only between the hours of 9 o'clock and 10 o'clock in the morning," for a man may drink wine at any hour he pleases without by that act becoming an assailant of public welfare or morals. To forbid the sale of liquor in public places after certain hours of the night is permissible, however, for the results of such selling would, at least in some cases, tend to disturb the sleep of the citizens at large.

Any law seeking to prescribe what a citizen shall or shall not do in his daily life, when the act involved brings no direct hurt to his fellows, must be considered with extreme caution.

By supplying the broadest platform of personal freedom, a republic furnishes the individual with the widest theater on which to exercise his personal volition and regulate his own acts according to the leaning of his nature to the right or to the wrong. If he nourishes the latter, he must abide by the consequences as they affect his condition or welfare.

For the very reason that liberty of conscience and latitude of will have been bestowed on him, the municipality must do as little as possible to interpose as a protection between the individual and the fruit of his option as to what he shall or shall not do in respect to his own conduct and his personal affairs.

Laws that restrict an individual's freedom of choice as to acts of his own which are not directly illegal are to be avoided, except when they are required to protect the community or others from the consequences of his actions. In return for his greater liberty, he must accept and abide by increased individual responsibility, and a municipal community should aim to be paternal only through its organized charities.

The recent measure of certain authorities in the city of New York to prevent expectoration in public conveyances seems unsanctioned in law, in spite of the fact that the results of such an effort are salutary. Constant expectoration in a public vehicle to an unusual and wilful and disgusting degree would doubtless constitute disorderly conduct, but a law forbidding the automatic, involuntary and reasonable physical functions, such as the secretions of the salivary glands, is unconstitutional.

—The Fabric Fire Hose Co., of New York, always kind to their friends, are now sending out some very neat leather pocketbooks as souvenirs of the most successful year the concern has ever enjoyed

—The Purington Paving Brick Co., of Galesburg, Ill., send us a very interesting and neatly printed pamphlet on brick paving. The books contain a great deal of valuable information for people who are interested in street improvements.

THE DECARIE GARBAGE INCINERATOR.

Owing to the growing investigation by city officials of the problem of garbage disposal, a description of the incinerator recently patented by Felix L. Decarie, of Montreal, Canada, will be of interest. The Decarie incinerator seems to possess all the sanitary and economical requirements, as the scientific construction of the apparatus provides for the disposition of offensive odors for the cremation of the garbage without the use of coal or oil, and for the generation of steam power. The drawings published with this article furnish a complete illustration of the system. Fig. 1 is a side elevation of the complete incinerator. Fig. 2 is a central vertical longi-

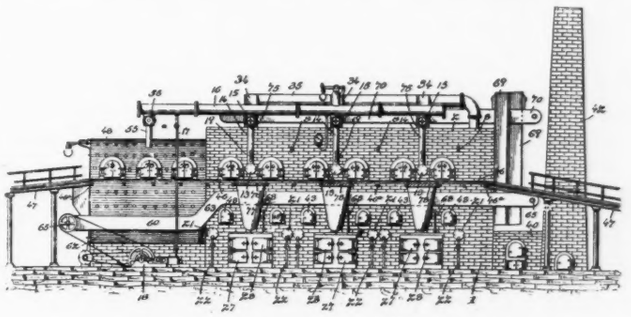


FIG. 1.—SIDE VIEW EXTERNAL.

tudinal sectional view of the entire apparatus. Fig. 3 is an enlarged vertical sectional view of one of the cremating chambers of the incinerator. Fig. 4 is a vertical transverse sectional view of the cremating chamber, showing its inclosure within the crematory building. Fig. 5 is a longitudinal sectional view of the drying chamber. Fig. 6 is a side elevation of a portable incinerator embodying the principal features of the invention. Referring to the accompanying drawings, the numeral 1 in Fig. 4 designates a furnace casing built of masonry and formed with an arched closed top portion. The furnace casing is built within the crematory building and upon a foundation below the floor line of the building. This casing is formed

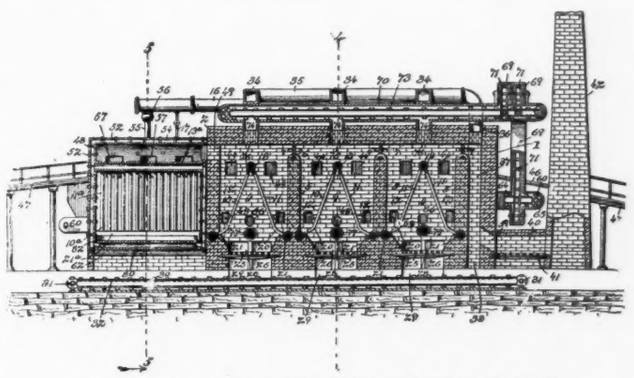


FIG. 2.—LONGITUDINAL SECTIONAL VIEW OF ENTIRE CREMATORY.

with a plurality of interior successively-arranged cremating chambers, separated from each other by vertical partition walls, as shown by numeral 5 in Fig. 3, and extending transversely across the entire space of the casing from top to bottom and from side to side thereof. These vertical partition walls are spaced at regular distances apart to form the successive series of cremating chambers, and at their upper ends, next to the top of the furnace casing, there are flue openings which provide communication between the several chambers and are designed to be covered and uncovered by means of cut-off dampers.

In each of the cremating chambers there is a pair of upwardly convergent tubular or hollow garbage-supporting grates, arranged transversely from side to side of the chamber, as designated by the numerals 10 in the drawings. These grates incline upwardly toward the transverse center of the cremating chamber and diverge from their upper adjacent ends to opposite lower sides of the chamber. These grates form an inverted V-shaped support for garbage and their disposition forms between them and the adjacent walls the garbage cells, as clearly indicated by the numerals 12 in Fig. 3, into which the garbage to be incinerated is dumped. The tubes or pipes comprising the garbage-supporting grates are fitted at their upper end in the lower side of an upper centrally-arranged distributing header-drum (13), extending transversely across the cremating chambers and projecting through the opposite side walls of the furnace casing. The opposite ends of this distributing header are fitted to the lower ends of the oppositely arranged steam conducting pipes (14), provided with suitable valves and connected at their upper ends with the steam-drums (16), arranged longitudinally above the furnace casing at opposite sides thereof to provide for the pipe connection designated by the numerals 14 in the drawings, with the projecting ends of the distributing headers within each of the series of the cremating chambers. It will therefore be seen that the upper oppositely arranged steam-drums serve to collect and store the steam generated within the tubular garbage-supporting grates of each cremating chamber, and by means of suitable pipe connections, steam may be conducted to an ordinary steam engine or utilized for other power purposes. The object of the pipe connections heretofore described is simply to utilize the heat within each cremating chamber for generating steam and storing same for power purposes.

From their connections with the lower side of the distributing headers (13), the grate tubes or pipes in each cremating chamber diverge downwardly to opposite sides of the chamber and near their lower end are angled, as at numeral 20, to form a rest for supporting the body of the garbage, which has a constant tendency to slip downward within the cells and to cave in as it becomes dried and is being consumed. The lower angled ends (20) of

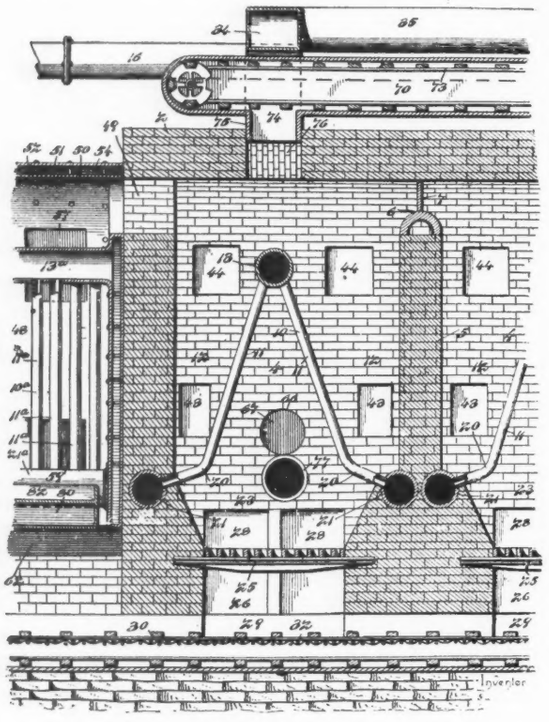


FIG. 3.—SECTIONAL VIEW OF CREMATING CHAMBER.

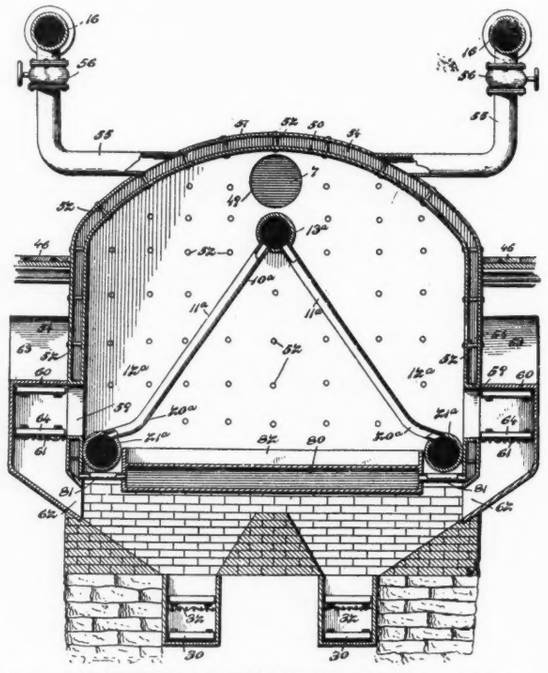


FIG. 5.—LONGITUDINAL SECTIONAL VIEW OF DRYING CHAMBER.

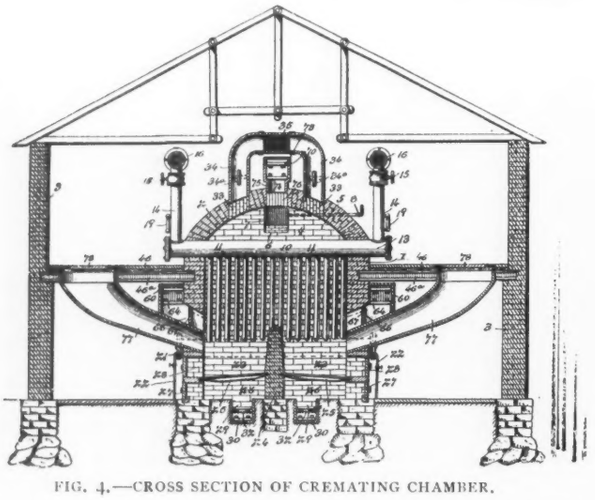


FIG. 4.—CROSS SECTION OF CREMATING CHAMBER.

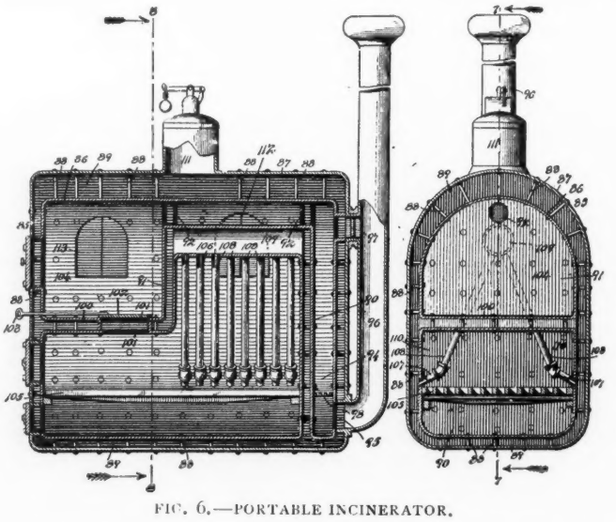


FIG. 6.—PORTABLE INCINERATOR.

the grate tubes or pipes are connected with water distributing drums (21), arranged transversely within opposite sides of the cremating chamber and having connected with their outer ends exterior to such chamber the water pipes designated by the numeral 22, which furnish a supply of water to the drums (21), in order that the pipes or tubes may be kept filled with water to prevent burning out and at the same time to provide for a continuous generation of steam for power purposes.

Within the bottom portion of each cremating chamber, below the inverted V-shaped garbage-support, the furnace casing is formed with a pair of oppositely located fire-boxes (23), arranged, respectively, at opposite sides of a centrally disposed fire-wall (24), built on the floor of the casing and extending well up into the space between the grates, in order to insure the deflection of the flame and products of combustion upward through the grates. At opposite sides of the central fire wall are arranged oppositely located fire-grates (25), below which grates are formed the ash-pits (26) with which communicate the door-inclosed ash-pit openings (27), formed at opposite lower sides of the furnace casing, and said casing is also provided with ordinary firedoors (28), at opposite sides, which cover openings communicating with the fire-boxes over the lower grates, whereby ready access may be had to the fires on the grates for stoking or otherwise attending to the same. Connecting with the pair of fire-grates within the bottom portion of each cremating chamber there is formed in the bed of the furnace casing open conveyor pits (29), extending longitudinally the entire length of the crematory and communicating with the interior thereof at the bottom, so as to receive the ashes and clinkers as they fall or are raked from the fire-grates. These open longitudinal conveyor-pits have arranged therein endless conveyor-aprons (30), and fitted within each open conveyor-pit, under the upper portion of the conveyor-aprons, is a separating sieve (32), which serves to hold thereon clinkers and ashes, while the finer portions of the ashes are allowed to sift through into the bottom of the pit, so as to be conveyed in one direction by the lower portion of the apron, while the clinkers and ashes on top of the sieve are conveyed in the opposite direction by the upper portion of the apron.

While the several cremating chambers communicate with each other through the damper-controlled flue-openings (6), each of the chambers have formed in the top thereof separate oppositely located flue-openings (33), in which are fitted the lower ends of the oppositely arranged branch flues or pipes (34) having elbow connections at their upper end with opposite sides of a common escape flue or pipe (35), arranged longitudinally above the furnace casing to provide for the branch flue connections therewith from each cremating chamber and fitted at one end in the top of the furnace casing, as at numeral 36, so as to communicate with the upper end of the vertical end draft-flue (37). The flue 37 is formed vertically within one end of the casing and communicates with the last cremating chamber of the series, and said vertical end flue extends to the floor of the crematory to form within its lower end a dust pit (38), and directly above this dust pit the draft-flue opens into an escape passage (39), communicating with a scent-consuming furnace (40), built at one end of the main casing and provided with a fire grate (41), on which is maintained a fire for consuming the odors that may be carried with the hot gases through the furnace.

Under ordinary conditions, when all of the cremating chambers are in operation, the dampers (34a) in the pipes are closed so as to compel the heat and other products of combustion to pass from one cremating chamber to another through the flue opening, and by reason of this circulation of the hot gases and other products of combustion, the gases of one cremating chamber are consumed in the next succeeding chamber, so that when the cremating chambers are thus operated in series very little, if any, odor passes out of the end draft-flue into the scent-consuming furnace, although it will be understood that whatever scent or odor may be carried out of the last cremating chamber will be disposed of by the fire in the scent-consuming furnace.

The furnace casing is provided on opposite sides thereof with a plurality of door-inclosed cell openings (43), communicating with the garbage cells to permit of access for the purpose of removing incombustible matter and also to permit the stoking of the garbage. Above the plane of the door-inclosed cell openings, the furnace casing is further provided on opposite sides thereof with door-inclosed feed openings (44), to permit of garbage being dumped into the cells for incineration. It will be observed that the series of feed-openings are arranged above the plane of the road-ways or dump floors (46), built on supporting girders within the crematory building on opposite sides of the furnace casing, as shown in Fig. 4. These road-ways or dump-floors run along each side of the furnace casing and are extended at their ends into inclined approaches (47), which lead from the road or street into the ends of the crematory building, so that the garbage carts or wagons can be driven directly on to the road-ways or floors and the contents thereof dumped into the cells of the cremating chambers.

These road-ways or dump-floors also extend along the opposite sides of the auxiliary heater casing (48), built at one end of the main furnace casing, next to the first cremating chamber of the series. The auxiliary heater casing, which is clearly illustrated by Fig. 5, essentially comprises inner and outer metallic shells (50 and 51), connected by intermediate fastening stays (52), so as to confine therebetween a steam jacket (54), with which communicates one end of steam conducting pipes (55), provided with suitable cut-off valves (56) and connected with their upper ends with one end of the steam-drum to provide means for constantly circulating the highly heated steam throughout the hollow shell of the casing, so that the radiated heat of such casing will assist in drying the garbage that is introduced into opposite sides thereof through the feed openings (57).

The heater casing is provided in opposite lower sides thereof with a plurality of discharge openings (59), communicating with adjacent open sides of conveyor boxes (60), arranged longitudinally of the entire crematory on opposite sides thereof. The portions of the conveyor boxes extending along opposite lower sides of the auxiliary heater casings are preferably provided with screen bottoms (61), below which are formed short deflecting chutes (62), extending through the side walls of the auxiliary heater casing below the plane of the openings (59), so as to discharge the material screened through the bottom back into the bottom of the heater casing.

At one end of the heater casing opposite longitudinal conveyor boxes are provided with short upwardly inclined portions (63), which prevent the elevation of liquid matter into the horizontal portions of the boxes extending along opposite sides of the furnace casing, and arranged to travel within the boxes the entire length thereof are endless conveyor aprons (64), the upper portions of which are supported for travel on rollers (65), while the lower portions travel on the bottom of the boxes and drag the garbage along therein to the feeding hoppers (66), connected with the bottoms of the boxes and extend laterally into the side walls of the furnace casing over the grate fires therein, so as to deliver dried garbage to such grates as fuel. Each conveyor box extends beyond one end of the furnace casing and opens at such end into the lower end of an upwardly extending elevator spout (69). The

elevator spouts for the conveyor boxes are convergently arranged at one end of the furnace casing and communicated at their upper end with the interior of a distributing box (70), arranged longitudinally above the furnace casing. The elevator spouts are provided with endless elevating belts or aprons (71), which serve to elevate the garbage delivered into the lower ends of the spouts into one end of the distributing box. There is an endless distributing apron or belt (73), in the distributing box, which drags the garbage along on the bottom of the box, which is provided at intervals with bottom discharge-openings (74), having short chute connections (75) with top feed-openings (76), formed in the top of the casing at the central point of each cremating chamber.

The garbage which is dried in the auxiliary heater is employed for fuel and distributed to the different cremating chambers in the manner described, but certain garbage which is delivered to the crematory may be in such a condition as to be immediately available for use as fuel, and to provide for utilizing garbage in this condition incline feed chutes (77) are arranged in pairs, respectively, at opposite sides of the furnace casing below the road-ways or dump-floors

The generation of steam power, the burning of the garbage without the use of other fuel, and the automatic separation of clinkers and ashes are some of the notable features of the Decarie system, and they are very important considerations. The steam power made by the operation of such an incinerator could be utilized by many municipalities for running water or electric light plants, and a great saving could be effected thereby. The ingenious arrangement for conveying the garbage from the drying chambers to the cremating chambers is a labor saving feature of much importance. Another point favorable to the Decarie furnace is the absence of the down-draft, thus obviating the frequent burning out of grate-bars, which seems to be quite an item of expense in the operation of other garbage crematories.

Among the accompanying illustrations is a sectional view of the portable incinerator, in which all of the essential features of the larger Decarie plant are embodied. A twenty-ton portable plant has been built and operated in Montreal. It has cremated from twenty-five to thirty tons of mixed garbage, including kitchen offal, ashes, dead animals, etc., per twenty-four hours, without smoke or odor, producing from two to three horse-power per ton of garbage. Mr. Henry W. Atwater, one of the leading citizens of Montreal, is the manager of the Decarie patents.

GET YOUR MONEY'S WORTH.

The thousands of city officials all over the country who pay three dollars a year for CITY GOVERNMENT get their money's worth. If you doubt it, come into our office and we will show you more letters like the one published below than you will have time to read:

CITY GOVERNMENT PUBLISHING CO., TOLEDO, O.
New York.

GENTLEMEN—

Enclosed please find check for $3 to pay for renewal of my subscription to January, 1899. I am more pleased with CITY GOVERNMENT than ever. I am one of the water commissioners of this city and derive much information from the paper.

WILLIAM JONES.

THIS LABOR TOO CHEAP.

Under the individual contract system, St. Paul will employ street sweepers, for cleaning asphalt streets by hand, at $6 per week. A number of men bid to do the work at less than that figure, but their offers were rejected.

A BIG CONVENTION OF CITY OFFICIALS

Will be the Second Annual Meeting of the League of American Municipalities.

Elaborate Arrangements Being Made at Detroit.—Some Topics Suggested for the Programme.

What promises to be the largest and most important gathering of city officials ever held in the world will be the second annual convention of the League of American Municipalities, to be held at the city of Detroit the first four days of August. Mayors, councilmen and other city officials throughout the country are already manifesting a lively interest in the coming convention, as is shown by hundreds of letters received by Secretary Gilkison asking for information pertaining to the event and making suggestions for the programme. There seems to be a very general desire on the part of the officials to have the convention devoted largely to the discussion of the many important questions of municipal government which are now attracting the studious attention of all progressive citizens. Among the topics suggested for the programme are:

Municipal Ownership of Public Service Industries—What progress has been made in this line in the United States and Canada and with what results? What should be its limitations?

Remuneration to Cities for Franchise Rights In, Over and Under Public Streets and Alleys—What remuneration, if any, should be exacted from light, water, street railway, telephone and subway corporations and how should it be collected?

The Civil Service—What results have been attained by requiring applicants for positions in city departments to pass an examination and making their tenure of office dependent on good behavior and mental and physical ability? To what departments should civil service laws apply?

Garbage Disposal—What has been the experience of municipalities in attempting to collect and dispose of garbage in a sanitary and economical manner? Are the present utilization and incineration inventions satisfactory and what does it cost to operate them?

The Contract System vs. the Day Labor System—Is it possible for a municipality to construct sewers, pavements, etc., by the day labor plan with less expense and with as good results as are obtained under the contract system?

Charities and Correction What — should be the scope and methods of municipalities in caring for the deserving poor and vagrants and in punishing miscreants? What institutions should be maintained for this work?

Municipal Purchasing Agencies—Should the supplies for all city departments be purchased through a single agency, composed of either an individual official or a committee of officials? Is the maintenance of such a purchasing department economical?

Boards, Single-Headed Commissions or Council Committees—Should the administrative affairs of the departments of public works, water, fire, police, parks, charities and correction be conducted by boards, single-headed commissions or council committees?

Clean Streets—What are the different methods of street cleaning and which is the most satisfactory and economical?

Public Water Supplies—What means should a municipality employ to supply its people with an ample supply of pure water at equitable rates? Is the general use of meters desirable? What systems of filtration are satisfactory?

Licenses—What should be licensed by municipalities and what should be the amount of the fees?

Regulation of Saloons—What policy is best to use in enforcing the laws pertaining to saloons?

The Social Evil—Can it be exterminated? Should it be segregated?

Electric Lines Overhead and Underground—What means should a municipality use to protect life and property from the improper construction of electric lines for telephone, telegraph, lighting and street railway purposes?

It is entirely reasonable to presume that a discussion by city officials of topics like those enumerated above will bring out a wealth of experience and new ideas. Mayors and councilmen who attend the convention and hear and participate in these discussions will return to their homes with a better understanding of the important questions

that their various constituencies expect them to solve, and they will be in a better position to discharge their official duties intelligently and economically.

The arrangements for the convention are already well in hand. At Detroit a special committee of the council, headed by Mayor Maybury, has been appointed to look after the preliminary matters pertaining to the convention, and this committee has already held several busy meetings. Upon its recommendation the Detroit council has rented the Light Infantry Armory and the Detroit Auditorium, two of the largest and best halls in the city, for the purposes of the convention. The armory will be used for the sessions of the convention, and the Auditorium for the exposition adjunct. The exposition will be one of the most instructive and attractive features of the meeting, as it will include all of the latest apparatus, appliances and supplies used by municipal departments. In addition to the display of fire and police department equipments, paving materials, voting machines, devices for water systems, catch basins, sewer inlets, fire alarm and police signal apparatus, street lamps, street cleaning articles, fire extinguishers, sewer and water pipe, water filters, etc., in the hall, there will be exhibited on the streets such interesting things as street sweeping machines, sprinkling wagons, gully cleaners, road rollers, rock crushers, fire engines, etc.

Mayor Maybury has already sent a communication to the park board suggesting that the ornamental flower beds about the center of the city be laid out in designs appropriate to the meeting of the league. At the suggestion of the council committee, the various secret societies and clubs of Detroit will keep "open house" during the convention, and provide entertainment for the delegates. If any one doubts that Detroit is going to make the convention a success in every way, he should read over the following local committees which have already been appointed, and upon which will be found the leading men of the city:

RECEPTION COMMITTEE.

Governor H. S. Pingree, Mayor William C. Maybury, President of the Common Council Otto C. Goeschel, Aldermen Walter H. Coots, John L. Batchelder, Massie W. Scovel, Homer McGraw, W. H. Beamer, Bernard Youngblood, Hugh T. Scullen, Walter G. Seely, Louis E. Tossy, Max C. Koch, W. C. Houghton, Oliver H. Grunow, Joseph Merrill, City Clerk John A. Schmid, City Treasurer Louis B. Littlefield, Captain James Millen, J. L. Hudson, Marvin Preston, Oscar Le Seure, M. D., Albert Stoll, Charles Flowers, City Comptroller Francis A. Blades, Allan H. Frazer, T. H. Christian, F. W. Marschner, James T. Sterling, Captain John Conline, Henry M. Reynolds, H. F. Chipman, George H. Lesher, Judge E. O. Durfee, George S. Hosmer, William L. Carpenter, Willard M. Lillibridge, J. W. Donovan, Robert E. Frazer, William Richert, Samuel J. Lawrence, Peter Sorensen, Joseph Belanger, General A. L. Bressler, Dr. B. R. Hoyt, Charles Heck, Sigmund Freund, Charles A. Buhrerand and Theophile Franhoise.

HOTEL AND ACCOMMODATION COMMITTEE.

Carl Stahl, Frank J. Licht, Peter Knauss, William Auberlin, Anthony Weiler, Herman Borck, Henry A. Weber, John Masak, Jacob J. Harrer, Henry C. Schuette, Samuel Goldwater, William F. Moeller, Oscar B. Marz, Charles Schmitt, John Gruesel, John F. Hacker, William C. Rathmann, William J. Chittenden, James Swartz, William Beyer, James Hayes, Fred. Postal, Carr & Reeves, Gabriel Chiera, Thomas Harrison, Louis Rehse and L. M. Knauss.

COMMITTEE ON ARRANGEMENTS AND ENTERTAINMENT.

Senator Thomas W. Palmer, J. C. Hutchins, Horace W. Avery, A. A. Schantz, C. F. Bielman, Lou Burt, Captain Joseph Nicholson, Colonel Fred. Farnsworth, E. D. Stair, Homer Warren, Edward R. Schremser, Matthais Stevakal, W. B. Thompson, Colonel Simon Schneider, Harry F. Starkey, Charles C. Kellogg, Gilbert Wilkes, Strathern Hendrie, C. J. Reilley, Charles M. Swift, Alexander I. McLeod, William C. Jupp, George L. Maltz, W. E. Reilley, Elks, A. O. U. W., K. of P., I. O. O. F., K. of St. J., Mystic Shriners, K. T., Chapters F. and A. M., Harmonie, Fellowcraft, Turner's Society, Detroit Post, Fairbanks Post and Detroit Club.

PRESS COMMITTEE.

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Active: P. C. Baker, Walter Hunsaker, R. H. K. Whitely, Theodore E. Quinby, Max Cohen, Harry Gregg, Thaddeus Varnum, H. A. Gilmartin, Glen Miner, Clay Cooper, A. B. Van Zandt, Harry Hetherington, Philip J. Reid, Edward R. Kranich, Howard Holmes, Dewy Bingham, Edward S. Davis, Alphonse F. Bahlcke.

EXPOSITION COMMITTEE.

Aldermen Auberlin, Tossy, Youngblood, Haarer, Schuette, Goldwater, Weber, Stahl, Moeller and John S. Gray, Thomas G. Craig, William J. Lee, Thomas Barlum, Charles H. Ritter, D. D. Thorpe, E. O. Krentler and Captain John Conline.

PROGRAMME COMMITTEE.

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AUDITING COMMITTEE.

George W. Stockwell, Michael Halloran, Frank P. K. Oldfield, Frank H. Gladding, Arthur Webster and Edward W. Klein.

The executive committee of the League are now arranging the programme, which will probably include many well-known city officials and very few outsiders. It is proposed to have a general discussion, open to all the delegates on the floor, of every subject brought before the convention.

The features of the entertainment programme, which will be arranged by the Detroit committees, will be a drive about the city, an outing at famous Belle Isle Park, receptions and suppers at the various lodges and clubs, and an elaborate banquet to close the festivities. The business sessions will be arranged so as to leave plenty of time for entertainment.

BIDS ON REPAVING ASPHALT.

The Barber Asphalt Company secured the contract at Buffalo, N. Y., for repairing asphalt pavements.

The bids were divided as follows: A, resurfacing; B, skimming, etc.; C, replacing concrete, etc.; D, scraping joints; E, cleaning and filling cracks; F, replacing stone along the railway tracks.

The bids were as follows on a basis of a square yard:

Barber Asphalt Company—A, $1.05; B, 64 cents; C, $1.90; D, 2 cents; E, 1 cent; F, 15 cents.

American Contracting Company—$1.50, $1.04, $2.45, 5 cents, 3 cents, and 22 cents, respectively.

Columbia Construction Company—$1.25, 85 cents, $2.20, 3½ cents, 2 cents, 17 cents.

Henry P. Burgard—$1.40, 75 cents, $2.25, 4 cents, 2 cents, 19 cents.

German Rock Asphalt Company—$1.53, $1.04, $2.35, 5 cents, 3 cents, 25 cents.

Utica Paving Company—$1.10, 90 cents, $2, 4 cents, 2 cents, 19 cents.

CITY GOVERNMENT.

Devoted to all Departments of Municipal Work.

PUBLISHED MONTHLY BY

CITY GOVERNMENT PUBLISHING COMPANY,

108 FULTON STREET, NEW YORK.

BUSINESS DEPARTMENT:
CLARENCE E. STUMP, B. F. GILKISON.

EDITORIAL DEPARTMENT:
H. J. GONDEN, Editor, F. D. POTTER, Associate.

TERMS OF SUBSCRIPTION.

In the United States and Canada.....per annum, $3 00
In all Foreign Countries..... " 4 00

Subscriptions payable in advance, by check, P. O. money order or express money order, to order of CITY GOVERNMENT PUBLISHING CO.

RATES FOR ADVERTISING SPACE QUOTED ON APPLICATION.

SPECIAL NOTICE.

City officials and friends of City Government visiting New York are cordially invited to make the office of City Government their headquarters during their stay in the city. Desks, stenographers and stationery are placed at their disposal, and their mail may be addressed in our care.

NOTE AND COMMENT.

In awarding contracts for city work and supplies officials should never forget the fact that the lowest bidder is not always the one who quotes the lowest figure. It frequently happens that the public suffers from the action of contract-giving officials who fail to draw the distinguishing line between price and worth. "A thing is not always worth its price," is an aphorism particularly applicable in this connection. We shall always contend that fair and open competition for public contracts should be encouraged, but we must at the same time admit that such competition is not without its dangers. We do not believe, for instance, that specifications for paving should be drawn so that bids will be accepted only on one or two kinds of asphalt, thus enabling the one or two contractors who control these products to combine for the purpose of exacting an unreasonably high price from the public; bids should be accepted on all kinds of asphalt, but the official who awards the contract should carefully judge the worth of the different materials as he considers their prices. It is quite probable that the material which is lowest in price may be much lower in value, and in case it is, it should be rejected, for the people do not want poor work at any price. Officials should always look with suspicion upon the contractor who offers a service at less than its known cost, because contracts let to such bidders seldom, if ever, bring satisfactory results. We have in mind several cities where gasoline lights are furnished by contractors at less than cost, and the service, as might be expected, is abominable. It is entirely away from the bounds of reason to expect good service from a contractor who is losing money. Unless a street is well lighted it might as well be left in darkness. It is better to pay for something and get it than to pay for nothing and get it. Our point may be illustrated by a case of several years ago, wherein a certain city which had advertised for bids on furnishing artificial light for its city hall and court house received tenders on both gas and incandescent electric lights. The bid on gas was the lower, but the incandescent lights, on account of their superior candle-power and their adaptability for the vault illumination included in the contract, were clearly preferable. In answer to an argument made for the acceptance of the lower bid, a member of the contracting board said: "If cheapness is the only thing to be considered in letting this contract, I suggest that we readvertise and accept bids also on kerosene lamps."

City engineers are inclining more than ever to domestic asphalts, and we think rightly so, for to-day many of our asphalt deposits are recognized as of great value and eminently suitable for paving purposes. Up to within the past four or five years the Trinidad asphalt practically enjoyed a monopoly of the asphalt paving business, but the tests made with the best of home asphalts have been so satisfactory that we see the end of the monopoly and imported article in this country. Pavements laid with the best American asphalts are as good as any laid with any of the imported materials, and the exorbitant prices of imported pavements of the past have been considerably lessened by reason of competition with the American product. Space prevents going into details as regards the relative merits of the various American asphalts. We would, however, refer to the Alcatraz Asphalt Company, of New York, whose materials are well known and who have laid a large quantity of work in New York and other cities. We would refer also to the Assyrian Asphalt Company, of Chicago, whose material is not so well known as the Alcatraz. They are owners of immense asphalt deposits adapted for pavements. Their product is rich in bitumen, possesses great elasticity and strength, and, in addition, it is claimed that it is impervious to street liquids and does not disintegrate, features which are not by any means common to all asphalt pavements. They have laid pavements in Salt Lake City; Marion, Ohio; Minneapolis, Minn.; Chicago and Evanston, Ill.; Grand Rapids, Mich., and many other places, and from what we can gather, their pavements, as a whole, are the equal of any. In the annual report of the City Engineer of Minneapolis for 1897 the following appears, showing the record of Trinidad pavements as compared with American materials.

Nicollett avenue, paved with Utah asphalt, certainly stands up better than Trinidad and the Ayers work (partly Utah and California). Of a total of 19,458 square yards Utah (Assyrian Asphalt Co.'s material) laid in 1895, 223 yards were repaired. Of a total of 9,656 square yards Trinidad laid in 1894, 188 yards were repaired. Of a total of 50,406 square yards Trinidad laid in 1896, 2,354 yards were repaired. Of a total of 36,065 square yards Ayers laid in 1896, 964 yards were repaired.

There are two American asphalts, at least, which have been proven to make good, durable pavements, and to us it would seem that there should no longer be any need to use imported material. We advocate "American asphalt for American pavements."

A RECORD BREAKING RUN.

The record breaking run of 424 miles in 425 minutes, exclusive of stops, recently made by a special newspaper train on the Erie Railroad from New York to Buffalo, calls attention to the excellent physical condition of that line and to the constant improvements which are being made in its service and equipment. Stone ballast, heavy steel rails, latest type of locomotives, vestibuled trains, sleeping and dining cars, and a complete system of block safety signals, show the close attention which the present management is devoting to the comfort and protection of its patrons.

FIRE DEPARTMENT NOTES.

—Chicago will soon put in a fire boat pipe line covering the thickly settled business districts on the south and west sides of the river.

—Charles T. Holloway, the well-known manufacturer of chemical fire engines of Baltimore, died on March 17. For five years Mr. Holloway was chief of the Baltimore fire department, and was favorably known among the firemen throughout the country. His business will be conducted hereafter by R. Ross Holloway.

—The annual report of the board of fire commissioners of St. Paul, Minn., shows the total number of alarms as 486, three more than in 1896. The fire losses were $174,345.58; the insurance amounted to $2,031,312.37, being $201,479.47 less than in 1896. The expense of maintaining the department for the year was $182,863.79. The report gave an estimate of the value of the property owned by the St. Paul fire department at $575,541.99.

—The executive committee of the International Association of Fire Engineers held a meeting last week at Columbus, Ohio, and made preliminary arrangements for the annual convention of the organization. October 18 was selected as the date, St. Louis having previously been chosen as the place. The Planters' Hotel was named as official headquarters. A detailed programme is being prepared for the convention. Those present at the committee meeting were Chiefs Kennedy, New Haven; Hill, Wyoming, O.; Black, Duluth; Humphries, Pittsburg; Haney, Jacksonville, Fla.; Devine, Salt Lake; Archibald, Cincinnati, and Knofflock, Mansfield.

—Chief Engineer William Earles, of the Findlay, Ohio, fire department, has submitted his annual report, which shows that during the year 1897 the department responded to 65 fire alarms, with a total loss of property of $13,404, of which amount $9,309 was not insured. The two old steam engines are about worn out. They need repairs after every run. The present force of the department consists of eleven men. The apparatus consists of two steam fire engines, one chemical engine, two chemical extinguishers, two hose wagons, one hook and ladder truck with 174 feet of ladder, three hose reels and one hand engine, 1,000 feet of first-class hose, 3,800 feet of second-class hose and 250 feet of chemical hose, and ten head of horses.

—Hart N. Cook has been elected chief of the fire department at St. Paul, Minn. He was born in Watertown, N. Y., in 1857. He went to St. Paul in 1883 and worked at his trade as a machinist. On October 24, 1883, he made application for appointment on the fire department, and the following day was appointed third pipeman with Engine Company No. 2, under Chief John T. Black. In the spring of 1884 a new chemical house was opened on Dayton's Bluff, and John Jackson was made captain of the station, and Mr. Cook was lieutenant under him. June 4, 1884, Lieutenant Cook was elevated to the rank of captain, and was placed in charge of Engine Company No. 1 by Chief Black. In the spring of 1889, when John Jackson was made chief, Mr. Cook was made second assistant chief, which position he held until elected chief.

—Arrangements have been made by which the tournament of the National Firemen's Association will be held in Omaha, Neb., during the summer. The entire matter has been turned over to President Wattles and Chief Redell, of the Omaha fire department, and they have made arrangements by which an enclosed space of sufficient size for the exhibitions will be provided. On this space will be erected a suitable building for storing apparatus and other property of the firemen, and another building which will be used for exhibition drills and for an actual fire. Chief Redell is most enthusiastic over the possibilities of this tournament. The last national tournament of firemen was held in Chicago about twenty years ago and was attended by over 25,000 people, there being nearly 15,000 firemen in the parade. He predicts that on this occasion there will be fully 50,000 people in attendance. A committee will arrange for purses which will be offered for the several contests. There will be $20,000 offered in prizes.—Omaha Bee.

—The city of Washington, D. C., which is generally foremost in municipal improvements, will probably give its fire alarm telegraph system an overhauling such as will bring it up to date. The district commissioners have asked the house committee on appropriations for $56,000 for this purpose. A recent investigation showed that about 30 per cent. of all the alarms were received incorrectly, causing delay and serious consequences. This defect is largely due to the fact that the apparatus in the central office is old and not at all commensurate with the growth of the system and the city. A large number of the boxes have been in use for over twenty-five years. It is proposed to replace all of the old boxes with those of the latest pattern, to add about one hundred boxes to the system, and to put in other Gamewell apparatus and appliances, including visual indicators.

—Chief Engineer Wesley Dimbleby, of the Utica, N. Y., fire department, says in his annual report: "The losses of the past year were greater than those of the previous year, but the fires have been more numerous. The proportion of losses to the number of fires is satisfactory proof that the standard of efficiency maintained by the department does not fall below that of the past. Visits to the several houses from time to time by the commissioners are respectfully solicited. They aid to influence the men in the discharge of their duties about their quarters. The actual needs of the men and their quarters can be observed personally. All this tends to increase the discipline of the department generally. The commissioners learn to know the men and the duties expected of them. Attendance at fires to witness the working of the department would be welcomed by all. Although the department is not manned or equipped as thoroughly as I could wish, I feel that the duty performed by it during the year is up to date and commensurate with the means at hand for the extinguishment of fires. I hope that the time is not far distant when the department will be a fully paid one." A list of fires and alarms is given. It shows: Number of fires, 101; number of alarms, 13; total loss by fire, $61,192.46; insurance of same, $1,368,565.54; amount of insurance over fire losses, $1,307,373.08.

—Mayor James G. Bailey, of Scranton, Pa., in his recent annual message to the council, said: "It afforded me great and particular pleasure to sign the ordinance providing for an increase in the pay of permanent men who work twenty-four hours every day at the several engine and hose houses. It would afford me even greater pleasure to sign an ordinance making the fire department of the city of Scranton an entirely paid organization. In this connection I would propose an improvement in the service of the fire department which it is in your power to make. At present six assistant chief engineers are provided for at an annual cost to the city of $600. These men, for the pittance which each receives, cannot and are not expected to give much, if any, time to the work of the department. I would suggest that instead of six assistant chief engineers, one assistant be named and that, in consideration of a slight increase over the combined salaries of the six, he be required to devote his entire time to the service of the department. The wisdom of such a change is apparent. What I have said pertaining to a proper recognition of policemen's services applies with equal force to the services of Scranton's gallant firemen. I congratulate Chief Hickey and his men upon the excellent work done by them during the past year and bespeak for them your consideration."

PUBLIC LIGHTING.

—The first report of the municipal commercial electric lighting plant at Anderson, Ind., shows the net earnings at 18 1-3 per cent.

—Contracts for extending the Chicago municipal lighting plant have been awarded by City Electrician Ellicott. At present the city operates 1,547 street lamps, and when the new extensions are completed, the number will be increased to 3,247.

—The fifteen years' exclusive franchise for gas lighting in the city of St. Cloud, Minn., expires September 6 of the present year, and the fifteen year's franchise for electric pole and wire privileges expires October 11. The gas and electric companies will undoubtedly ask the council for an extension of their franchises.

—The Mutual Electric Light Comany have submitted a proposition to the board of supervisors of San Francisco, in which they offer to supply the same number of lights for streets and public buildings now furnished by the San Francisco Gas and Electric Company, at a cost to the city of $40,000 per year less than the city is now paying. The offer is made with provision that the new company are to have the privilege to erect poles in the streets.

—In his last annual message to the council, Mayor Warwick, of Philadelphia, says that he confidently believes that the future will prove the wisdom of leasing the city gas works. The message says: "When the proposition of the United Gas Improvement Company was made I deemed it worthy of consideration. It was endorsed by many leading business men of this community, by almost the entire press of the city, and the offer was made by a corporation with capital, with experience and already in successful operation in many of the cities and towns of the United States. It was officered and controlled by business men of our own city, and so organized that it could at once, in case of lease, take immediate charge of the works. After two months' careful study of the matter I submitted the proposition to councils. Carefully I watched the progress of the measure through both Chambers and saw nothing to change the opinion I formed at the time of its original submission to councils. It was of the utmost importance that the lease should be made with a company so experienced, so organized, so equipped and so capitalized that there would be no delay whatever in the continuing of the work in the manufacture and supply of gas."

—Bids for public lighting at Charleston, S. C., were as follows: Two bids from the Charleston Gas Light Company: (1.) According to the terms of the present contract, that is, 854 lamps, at $16.62 per lamp per annum, moonlight schedule, or $14,195.38; besides this to light the public buildings at $1.50 per thousand cubic feet. (2.) To light 1,240 lamps, moonlight schedule, for $20,016.68 per annum, or $16.20 per lamp, and also to light the public buildings for $1.50 per thousand cubic feet. The Charleston Edison Light and Power Company submitted bid: (1.) To furnish according to terms of the present contract, moonlight schedule, 112 arc lamps at $100 per lamp per annum and one arc lamp, all night, at $144 per year, and eight incandescent lights for $192, making a total of $11,536. And (2) to furnish 300 arc lamps to burn all and every night for one year at $90 per lamp per annum; for three years at $87.50 per lamp; for five years at $85 per lamp; for a seven years and six months' contract, $82.50; for a ten years' contract, $80 per lamp. And also offer to wire up and install in the City Hospital, Riverside Infirmary and Police Station, free of charge to the city, as many incandescent lights as there are at present gas jets, provided a one or more year contract be given, current to be by meter at 10 cents per 1,000 Watt hours, which corresponds to gas at $1 per 1,000 cubic feet.

POLICE DEPARTMENT NOTES.

—J. Fred Fisher has been appointed chief of police at Lancaster, Pa. Until his appointment he was night clerk at the Pennsylvania railroad station.

—Victor Rosewater, of the Omaha *Bee*, has filed charges with the governor of Nebraska against Lee Herdman, James H. Peabody and D. D. Gregory, members of the Omaha fire and police commission. Mr. Rosewater alleges that the fire and police commissioners named entered into an agreement that whenever it was expeditious or necessary they would unite to constitute a majority and control the board and exercise its power and influence for political ends, regardless of the effect such action might have on the welfare of the police department. Mr. Rosewater declares the result is not uniform enforcement of laws or ordinances, or adequate police protection to citizens.

WATER DEPARTMENT NOTES.

—The total net revenue of the Philadelphia water bureau last year was $1,306,204.31. The consumption of water was 187 gallons per capita per day, as against 89 gallons ten years before.

—The board of water commissioners of Syracuse, N. Y., will invite the members of the American Waterworks Association to make a visit of inspection to the Syracuse water plant in June, when the association meets at Buffalo.

—A bill has been introduced in the Ohio legislature providing for the payment of a salary of $900 a year to each of the water commissioners of Toledo. It will be argued that there was a time when the president of the board got $2,000, and each of the other two members $300 a year, when the duties of the office did not demand one-fourth of the time and attention they do now. When the nationalist party secured the city offices a bill was passed, cutting the salary of the waterworks trustees to one dollar a year.

—The city of Montgomery, Ala., has purchased the local waterworks company's property for $420,000. The price will be paid in 4½ per cent. waterworks bonds.

—It is stated on good authority that the Des Moines Waterworks Company have at last agreed to accept the terms of purchase offered by the city. There are some minor modifications, but reckoning the difference in interest rates and certain extensions of the water company mains that have added to the value of the plant, the price is the equivalent of the $800,000 offered by the city council last year. Owing to certain legal proceedings the plant cannot be transferred to the city until about January 1, 1900.

—Medina, N. Y., has just renewed its water contract for five years. By the terms of the contract the reservoir is to be kept two-thirds full, at least, as a reserve fire supply and the stand pipe at Medina is to be kept full or nearly so at all times. The village reserves the right to demand a supply of water at any time when it is deemed necessary equal to 1,000,000 gallons for each day. It was decided to allow the meter rates to remain as at present. They are 50 cents for each 1,000 gallons for consumption of under 2,500 gallons each month and 30 cents for each 1,000 gallons for consumption of over 2,500, with still lower rates for the very large consumers. The minimum rate is to be $5 a year for any private service.

—The programme for the nineteenth annual conven-

tion of the American Waterworks Association, which will be held at Buffalo, beginning June 14, has been arranged. The first day will be devoted to three business sessions, and on the second day there will be a trip to Niagara Falls and to the Holly Pump Works at Lockport, N. Y. On the third day there will be business sessions in the morning and evening, and in the afternoon the delegates will be shown the different engineering works in Buffalo. Toronto will be visited on Friday, and on Saturday there will be an exhibition of the Buffalo fire department. Colonel Ward, superintendent of the Buffalo water department, is at the head of the local committee on arrangements.

PERSONAL.

—David F. Peebles, who is a candidate for the municipal assembly at St. Paul, Minn., is one of the brightest and ablest young lawyers in the northwest.

—I. Simons, city electrician at Charleston, S. C., has been unanimously re-elected by the council.

—Theodore B. Willis, the last commissioner of city works of Brooklyn, has been indicted on a charge of having accepted a bribe for letting a city contract.

—John MacVicar, president of the League of the American Municipalities, was re-elected mayor of Des Moines, on March 28, by a majority of 1,222, after a hotly contested campaign, in which he combated powerful private and political interests. Being a strong advocate of municipal ownership. Mayor MacVicar, of course, encountered the antagonism of all of the companies holding franchises in his city.

—Edwin S. Smeltz, who recently ended a term as mayor of Lancaster, Pa., has been elected by the council to the office of city clerk.

—Thomas C. Wiley has succeeded John F. Stauffer as street commissioner at Lancaster, Pa.

—J. G. Olmstead, recently elected alderman-at-large at Des Moines, Ia., is one of the leading wholesale merchants of the city. His election was a clear case of "office seeking the man," as he made no effort whatever to secure either nomination or election.

CITY HALL STUDY CLUB.

A most progressive city official is Lawrence E. McGann, formerly a member of congress and now commissioner of public works at Chicago, Ill. He has corrected many abuses that formerly existed in the Chicago public works department and his latest idea for improving the service is to institute a "city hall study circle." The members of the class will be the heads of the various bureaus included in the department of public works and the object is the promotion of research and the bringing out of new and original ideas on municipal problems. The plan of the chief of the public works department is to take up some subject of interest and importance to the department and submit it to the various bureau heads interested. The employes will be given a week to cogitate and investigate, they will report to the bureau chief and he will prepare on the following Monday a written report, which will be submitted to Mr. McGann. A course of studies has not as yet been mapped out, but among those that will be first taken up are: The surfacing of macadam streets with sheet asphalt, the laying of vitrified brick to prevent decay of asphalt, the daily collection of garbage and the contract system as applied to street cleaning. All of these will be looked at from both a practical and a scientific standpoint, and Commissioner McGann expects much good will result in the way of bringing out valuable hints to the city.

FIFTY IN A BUNCH.

That CITY GOVERNMENT is *the* paper for city officials in all departments is shown by its constant and rapid increase in circulation. The success of this paper has never been paralleled in the history of trade or class journalism. One great factor in the rapid upbuilding of CITY GOVERNMENT'S circulation is the large number of orders received from city councils to send the paper to all members and heads of departments. Here is one of the latest:

DETROIT, MICH., APRIL 4, 1898.

CITY GOVERNMENT PUB. CO., NEW YORK.

GENTLEMEN: Commencing with the April number of CITY GOVERNMENT, please mail the paper to the following addresses, as per council order of March 30, 1898, for 50 copies: [Here follow the names of fifty Detroit officials.]

Yours truly,

F. A. BLADES, City Controller.

SHOULD JOIN THE LEAGUE.

The League of American Municipalities has issued its first circular of information. It takes up the subject of municipal electric light plants and gives a large amount of information bearing on the subject of municipal ownership and the contract system. Statistics are quoted from a score or more cities showing costs of plant, capacity, the number of lights in operation, receipts and expenses, and other data useful to those interested in this subject. The league proceeds on the theory that improvement in municipal government must necessarily come from city officials themselves, and therefore these officials should be given every opportunity to study and learn of the improvements in their respective lines. Any city that desires to make a forward movement along any line of municipal development should join the league and take advantage of the assistance which the league's information bureau can give.—Post, Syracuse, N. Y.

CHICAGO MUNICIPAL APPROPRIATIONS.

Cleveland, Ohio.

EDITOR CITY GOVERNMENT:

Is it true that the appropriations for the city departments of Chicago are less this year than they were last year? If so, what is the difference?

ALDERMAN NO. 6.

Following is a comparative statement of the Chicago appropriations for 1897 and 1898:

	Appropriation.	
	1897.	1898.
Building department	$53,150	$62,302
City clerk's office	15,000	27,000
Civil service commission	35,000	40,000
Contingent fund	8,000	50,000
Cost of collecting city taxes	102,000	100,000
City engineer's office	25,860	27,160
Repairs to bridges and viaducts	100,000	85,000
Bureau of streets	270,000	916,788
Sidewalk repairs	55,000	55,000
Special assessments	51,550	243,624
Department of public works	1,455,548	1,430,649
Bureau of sewers	193,065	195,284
Bureau of water	247,924	291,169
Election expense	125,000	200,000
Fire department	1,562,520	1,487,568
Health department	171,220	184,960
Bridewell	95,000	50,460
Interest account	905,428	900,000
Judgment account	300,000	217,500
Legal expenses	35,000	35,000
Police department	3,356,910	3,829,810
Public library	244,357	232,126
School board	6,530,600	6,140,533
Street lamp department	600,000	400,000
Department of electricity	.....	259,255
Total for all purposes	$16,472,699	$16,193,498

MEMBERSHIP BENEFICIAL TO CITIES.

That membership in the League of American Municipalities is beneficial to officials and taxpayers is shown by the numerous letters written by mayors of membership cities commending the work of the organization. Here are a few of these letters :

Louisville, Ky., March 21, 1898.

B. F. GILKISON, Secretary,
League of American Municipalities,
New York City.

Dear Sir: I write to say that since the city of Louisville became a member of the League of American Municipalities, we have frequently found it greatly to our advantage in the way of supplying information of vital importance to us, upon the shortest notice. Every officer of the city, and every member of the general council, who has expressed himself to me, has declared his perfect satisfaction with our League membership.

Yours very truly,
CHAS. P. WEAVER,
Mayor.

Atlanta, Ga., March 21, 1898.

B. F. GILKISON, Secretary,
Downing Building,
New York.

Dear Sir: I desire to express to you my great satisfaction of the manner in which the business for which the League of American Municipalities is being conducted through your office. I have already received very valuable information and suggestions through the medium of the League that has more than compensated the city of Atlanta for the small amount of money which she has invested as a membership fee.

The importance of this League to all municipal authorities who are really interested in progressive methods cannot be over-estimated, and I have no hesitation in saying that under the system adopted the League will soon take rank amongst the most important modern agencies for the collection and dissemination of important municipal data, that will be felt more and more as the membership of the League increases.

With congratulations and best wishes, I am,
Very truly yours,
C. A. COLLIER,
Mayor.

Detroit, Mich., March 21, 1898.

B. F. GILKISON, Secretary,
League of American Municipalities,
New York.

Dear Sir: It is the wisdom of great experience that conventions of all kinds promote the welfare of each representative. I deem that it applies with particular force in the case of municipalities. An assembly composed of men who have been chosen to represent the interests of their respective cities affords an opportunity for the interchange of views upon most important subjects, all looking towards better government. Besides this it is an occasion where each city has the opportunity of forming friendly relations with others. Such opportunities are always of great service.

Enterprising manufacturers and inventors will improve the opportunity of this annual gathering to make a display of their products, and from the point of economy no question can be raised that this exposition adjunct will be of value to all who witness it. To illustrate the extent of this feature, I will state that we have provided for the largest hall in the city, and several acres of ground, to be placed at their disposal. It is with pride that Detroit considers herself selected this year as the place for holding the annual convention of the League, because we will be able to show to many cities, institutions which they may not have adopted, and which may appear to them to be worthy of their consideration. It is a further pleasure to think that we have an opportunity to extend the friendly hand of hospitality to the cities of the United States, and the more of them that are represented here the more will be our satisfaction and pleasure.

In conclusion, I desire to say that from these great conventions will come a broadening and maturing opinion upon the complex subject of municipal government. Sound economics will be most fittingly discussed, and immense interests will receive conventional attention. Annual pilgrimages of the cities of this country to a certain one that may be selected cannot but help but turn our minds to the things which weigh down upon us, and at the same time offer a most pleasant recreation at a most pleasant time of the year. With sentiments of respect, I am,

Cordially yours,
W. C. MAYBURY,
Mayor.

Nashville, Tenn., March 21, 1898.

B. F. GILKISON, Secretary,
League of American Municipalities,
New York.

Dear Sir: I desire to state that while the city of Nashville only recently became a member of the League, yet much valuable information has been received by various members of our City Council, through the League. It should receive the hearty approval of all city officials, and should also receive their encouragement in every way possible. I feel that every city of any pretense should become a member of the League, and I feel that if the objects of the organization were fully explained to them that the membership would be very materially increased. Respectfully,

R. H. DUDLEY,
Mayor.

Jersey City, N. J., March 22, 1898.

B. F. GILKISON, Secretary,
League of American Municipalities,
Downing Building, New York City.

Dear Sir: I would like to express my appreciation of the benefits that I deem will be derived from membership in the League of American Municipalities. It strikes me that it is a good thing to have such a League, inasmuch as it provides an easy means of coming in communication with out sister cities on all questions pertaining to the welfare of a municipality. It enables officials of one city to easily acquire whatever information is desired in their respective departments. I believe this is a right step in the direction of good municipal government, and trust that the organization effected last year will be a permanent one.

Yours respectfully,
EDWARD HOOS,
Mayor.

LIKES THE BRICK PAVING.

President W. B. Smith, of the Ann Arbor, Mich., board of public works, recently paid a visit to the cities of Buffalo and Rochester, N. Y., for the purpose of investigating the cost and durability of the different pavements in use in those cities. He reported that Buffalo had about six miles of brick pavement. "Some of it is on heavy traffic street, and some on residence streets, and some has been down six and eight years, without costing a cent for repairs, and some of that brick pavement was as fine as any I ever saw," says the report. Mr. Smith says that for economy and durability the brick pavements are the best in use in Buffalo. He reports that brick is the most satisfactory pavement in Rochester, also.

—The city council of Marshalltown, Iowa, has adopted a resolution ordering subscriptions to CITY GOVERNMENT for all its members and the municipal department heads. This paper is now recognized as a necessity for all city officials, and many councils are making appropriations for subscriptions.

R. D. KNIGHT,
Mayor, Jacksonville, Fla.

T. J. MEDILL, JR.,
Mayor, Rock Island, Ill.

F. G. PIERCE,
Mayor, Marshalltown, Ia.

GEORGE L. BURTON,
Council, New Haven, Ct.

WILLIAM C. BAKER,
Mayor, Providence, R. I.

W. F. HITE,
Mayor, Huntington, W. Va.

RICHARD H. RYDER,
Council, Pawtucket, R. I.

W. G. MELLINGER,
Mayor, Cumberland, Md.

J. A. JOHNSON,
Mayor, Fargo, N. D.

A GROUP OF WELL-KNOWN CITY OFFICIALS.

POPULAR IN THE FIRE APPARATUS TRADE.

Here is a good likeness of Mr. A. W. Dolfini, the head of the well-known fire apparatus house of A. W. Dolfini & Co., of New York. Among the large line of goods handled by this firm is the "Midget" smoke protector, which is probably the simplest and at the same time the most effective device ever invented for the protection of firemen while working in dense smoke. The sales of the "Midget" throughout the country have been very large and they are increasing as the device becomes better known. Mr. Dolfini is a gentleman of many good qualities, which combine to make him exceedingly popular with the trade. He is well known and well liked by firemen throughout the country.

A. W. DOLFINI.

SIMPLE AND EFFECTIVE.

The accompanying cut illustrates the simplicity and effectiveness of "Kilfyre," the well known dry powder fire extinguisher. The cut shows the explosion of a parlor lamp and the ease with which such a fire can be

instantly put out by even a little girl using a "Kilfyre" tube. All that need be done is to sprinkle a little of the dry powder compound at the base of the flame and nothing remains of the fire. The compound to not injurious to even the finest of fabrics, and the only damage done in such a case as is here illustrated is the breaking of the lamp.

"METROPOLITAN" ENGINES FOR NEW YORK.

The first size "Metropolitan" steam fire engine ordered from the American Fire Engine Company, Seneca Falls, N. Y., for the Greater New York fire department, was delivered to the city April 6. Chief Bonner, Captain Ryan, superintendent of the repair shops, and other fire department officials were present, as well as a number of visitors from out of town. All expressed themselves as being delighted with the appearance and working of the engine, which marks a distinct advance in steam fire engine manufacture. On the same day a contract was awarded the American Fire Engine Company for two more "Metropolitan" engines.

A POPULAR MAYOR RE-ELECTED.

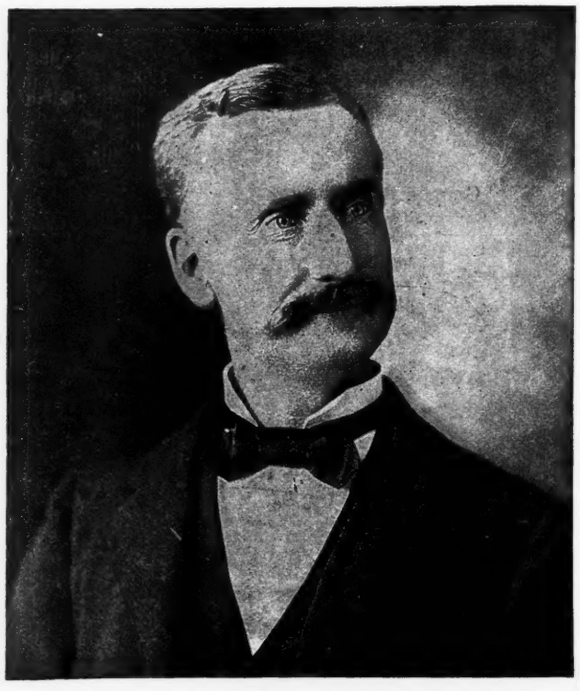
J. A. Johnson, vice-president of the League of American Municipalities for North Dakota, has just been re-elected mayor of Fargo by the largest majority ever given a candidate for that office. Mayor Johnson will be pleasantly remembered by all those who attended the Columbus convention, for he was one of the most popular men there. Other Fargo officials have been elected as follows: John Urion, treasurer; E. P. Geary, police justice; A. G. Hanson, city justice; A. J. Craig, P. H. Cummings, Joseph Ames, A. G. Lewis, S. B. Clary, Alex. Stern and T. Ostby, aldermen.

THE MUNICIPAL ELECTRICIANS.

W. Y. Ellett, of Elmira, N. Y., the energetic president of the Association of Fire and Police Telegraph Superintendents and Municipal Electricians, is doing effective work in building up the membership of the organization. He is making an especial effort to bring the municipal electricians, who are made eligible to membership by a recent amendment to the constitution, into the association. Arrangements for the forthcoming annual convention, to be held at Elmira, August 9, are under way, and there are indications of a large attendance and a very profitable and enjoyable time.

MAKES FIRE APPARATUS.

S. S. Seagrave, whose portrait is presented herewith, is the head of the well-known firm of Seagrave & Co., fire apparatus manufacturers, of Columbus, Ohio. He is particularly famed as the maker of the Seagrave trussed



S. S. SEAGRAVE.

ladder, now in successful use by nearly every fire department in the land. Seagrave & Co. have an enviable reputation for turning out only the highest quality of work in the line of hook and ladder trucks, hose carriages, etc.

EMPLOYES IN CITY ENGINEER'S DEPARTMENT, MINNEAPOLIS.

1. F. W. Cappelen, Member Am. Soc. C. E., city engineer. 2. I. E. Howe, assistant city engineer. 3. E. R. Dutton, engineer. 4. W. M. Fox, engineer. 5. W. F. Deaing, sidewalk engineer. 6. R. L. Cox, chief clerk. 7. F. G. Parkhill, bookkeeper. 8. Nellie Burns, stenographer. 9. B. H. Durnam, transitman. 10. W. E. Stoops, transitman. 11. J. E. Carroll, draughtsman. 12. Walter Walsh, levelman. 13. Albert Graber, levelman. 14. R. Fox, levelman. 15. Carl Ilstrup sewer engineer. 16. N. Lund, assistant sewer engineer. 17. R. J. Stark, bookkeeper. 18. W. L. Ainy, draughtsman. 19. T. Deacon, chief sewer inspector. 20. M. E. Sleeper, street foreman. 21. C. H. Brinsmaid, cement inspector. 22. August Rydh, timekeeper. 23. Stanley Bezoier, timekeeper. 24. A. B. Coe, bridge engineer. 25. K. Oustad, draughtsman. 26. W. W. Redfield, engineer water works. 27. G. Bogert, draughtsman. 28. H. D. Forneri, reservoir engineer. 29. J. R. Gray, timekeeper. 30. E. Nexsen, levelman.

FIRE EXTINGUISHER TESTS.

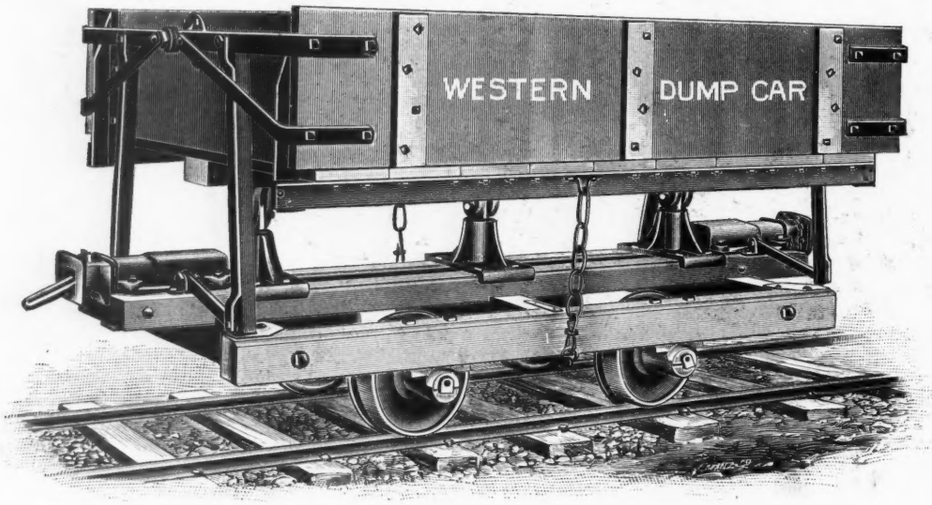
An exhibition of a fire extinguisher was given on East Broad street, Friday evening, in the presence of Chief Heinmiller, Assistant Chief Daniels, Railroad Commissioner Kayler, a large number of insurance men and others. The extinguisher exhibited is something new and unlike the old liquid chemical extinguishers. It is a discovery known as "Kilfyre," a dry powder which, thrown upon the fire, forms a gas which is death to flames. In giving the exhibition a large pine pox twenty feet high and about five wide and deep was stood on end after being saturated with pine tar, plastered with newspapers and again covered with a solution of pine tar and oil, a match was touched to the interior of the box and in a few minutes the flames were so hot that the spectators were driven back quite a distance from the fire. When the fire was under good headway a quantity of the powder was thrown into the lower part of the flames and almost in an instant the fire was out, not even a spark remaining. Another test was made with a fire in a long wooden shaft. Flames were shooting five feet out of the top of the shaft, when a couple of handfuls of the powder were thrown in at the bottom, and the blaze was out in a couple of seconds. The members of the fire department were pleased with the result of the test.—Columbus, O., *Dispatch*, April 2.

Last Wednesday evening there was a fire at Twelfth and Olive streets for the purpose of demonstrating the merits of a new fire extinguisher known as "Kilfyre." There was constructed a building 12 by 8 by 6, with one side open, to represent a room; the inside was coated with coal tar and saturated with kerosene. A large number of invited guests having assembled and everything in readiness, the structure was ignited. Instantly fierce flames enveloped the building, the heat driving the guests back 30 feet. At a given signal from Chief Swingley, of the fire department, a representative of the company advanced with a tube of "Kilfyre" in his hand, and with one sweep threw the powder at the base of the fire, and the flames were extinguished instantly. The complete success of the undertaking was approved by the hearty applause of the assembly. Following this demonstration there was erected what represented a chimney flue over 20 feet high, the inside of which was also coated with coal tar and saturated with kerosene. The flue was ignited at the bottom opening, and soon the flames were pouring out of the top. A handful of "Kilfyre" was thrown into the opening, and instantly the flames were put out. This extinguisher undoubtedly possesses all the merits claimed for it. The Monarch Fire Appliance Company, of Missouri, with offices in the Union Trust Building, control the sale of this meritorious article.—St. Louis *Globe-Democrat*, April 3.

—The Indianapolis board of public works have decided upon a telephone franchise, which will be submitted to bidders in three weeks, the terms of which are that the annual rental for telephones in business houses within two miles of the exchange shall not exceed $40 per annum, and for residences within the same limits not to exceed $24; the successful bidder for the franchise shall pay the city $6,000 a year, shall place all wires underground within one mile in all directions from the central station, and beyond that limit run poles only in alleys. The franchise is to be granted for twenty-five years, and if not extended the plant is to be appraised and the city given the right to take it at the appraised value.

THE WESTERN DUMP-CAR.

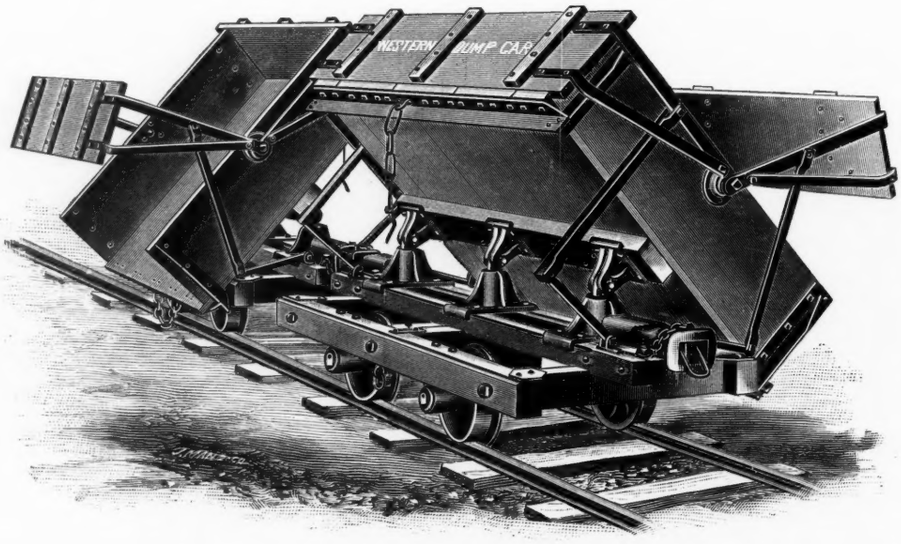
The accompanying cuts illustrate the Western dump-car, which has been thoroughly tested, and all contractors who have used it, and other experienced car-men who have seen it, concur in the opinion that it is superior to any other manufactured. The standard car has capacity of one and one-quarter cubic yards, and is 24-inch gauge, the wheels are 12 inches in diameter, are made of the best car-wheel iron, the face being smooth and properly chilled; axles of 2-inch steel with bronze journal bearings, 1⅞x4½ inches; improved journal boxes and improved spring couplers. The car dumps on either side, the side-boards working automatically, and afford ample clearance for dumping the load. The construction permits the side-boards to be put in perpendicular position by simply raising them up by hand, where they remain until pulled down by hand. This is a great advantage in loading dirt or stone into the car, as it can be nearly filled without throwing the material higher than the floor of the car; only a small part of it having to be raised over the edge of the sides of the bed after the side has been lowered. When lowered either side opens as the car is dumped, and closes as the bed is returned to an upright posipostion, both automatically and instantly.



The height of the top of the 24-inch gauge car, with capacity of one and one-quarter cubic yards, is 42 inches above the top of the rail it stands on. This is no higher than other cars of 18-inch gauge, while the bed, in dumping, assumes a more nearly perpendicular position in the Western than in any other car. The Western dumps at an angle of 48 degrees from the horizontal, while other makes of cars have a dumping angle of about 43 degrees. Contractors will recognize the advantage of wider gauge, as lessening the danger of the car being thrown off the track in dumping, and in the economy of keeping the track in good condition. The uprights which operate the side-boards act as braces to steady the beds and prevent the tilting of the car when the load is being dumped into or out of the car.

While 24 inches is the standard gauge, cars will be made any gauge desired. The construction enables the by simply raising them up by hand, where they remain manufacturers to get the usual 43 degree dumping angle on the 18-inch gauge cars (1¼ yards capacity) with extreme height of only 37½ inches above rail, nearly five inches lower than other cars of the same gauge, or, with our 48 degree dumping angle, the height would be 39 inches above rail.

The car weighs about 1,400 pounds, and twenty-one of them can be loaded on a flat car. The Western Wheeled Scraper Co., of Aurora, Ill., are the manufacturers of the car.



NEED OF PLAY-GROUNDS IN CITIES.

Childhood and youth have suffered most from the overcrowding in cities, and it may be that in the future great city there will be no place for children; at any rate the present attitude of the city toward the child betrays that tendency, treating him as an insufferable nuisance. There is no room for the child in the tenements and not much more in more comfortable homes. When he escapes to or is thrown upon the street he must become a law-breaker for indulging a natural inclination for movement, exercise, noise and fun. When he acquires sufficient agility to escape the perils of ordinary street traffic, he is still not free from the dangers of pursuit by the police.

He is not allowed to "walk upon the grass" because this would destroy the only "municipal art" which the municipality prides itself in possessing, which is encouraging and as it should be in the right place, but there are some places in which it is all wrong. He is always chased, sometimes clubbed and occasionally shot at. Other people's children are a constant source of annoyance and complaint of every housekeeper. If the future should disclose a celebrity born and reared in New York in the present decade, it will probably be as a fine example of an enemy of organized society with a grievance against the human race.—From "The City's Plan," by Julius F. Harder, in March *Municipal Affairs.*

CORNER LAMPS AND SIGNS.

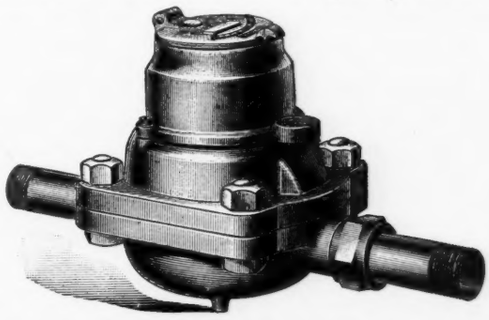
Many persons brought up in the smaller cities and towns do not realize the necessity of having the names of the streets placed at the corners of street crossings, as they themselves, knowing the names of every street, forget how difficult it is for a stranger to find his way about their town. Especially in the larger cities it is of great importance that the names of streets should be placed upon the corners of all crossings. There is no better way to do this than by the use of signs placed in the corner lamps, where they can be read day or night. Attention is called to the accompanying cut of "The Miner" corner lamp, which is one of the most complete things of the

kind before the public. This lamp is very strongly made, and is most economical to keep in repair, as all the various parts are interchangeable, and should any part become broken it can be readily replaced. The signs are cut in ruby or blue glass, and are entirely independent of either the globe or dome, and if either are broken, can be replaced by raising the cover of the lamp and inserting a new sign at a very trifling expense. The cut shows a lamp with opal dome, and polished brass ventilator. They are also made with tin, galvanized iron or copper tops. These lamps can be furnished, complete with four signs, at from $4.50 each up, according to style and finish. The cut shows the No. 51 corner lamp manufactured by Thomas T. W. Miner, successor to the late Jacob G. Miner, 821 and 823 Eagle avenue, New York city.

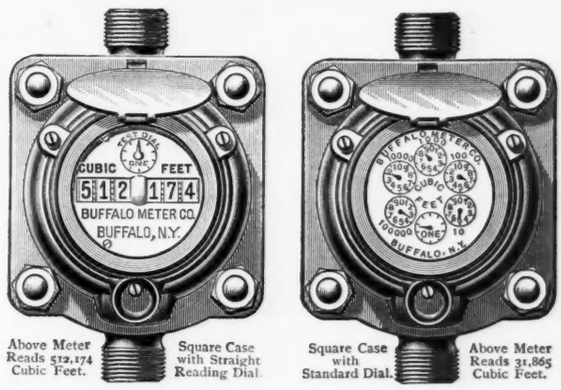
—After a long drawn out battle between a number of contractors, in which all kinds of charges of corruption have been made, the city of Milwaukee will construct its own garbage disposal plant. An ordinance providing for the issue of $80,000 of bonds for this purpose has been pased and signed by the mayor.

NIAGARA WATER METERS.

The accompanying cuts illustrate the well-known Niagara water meter, manufactured by the Buffalo Meter Co., of Buffalo, N. Y. Niagara meters are in use in over 700 cities and towns, and they have never failed to give thorough satisfaction. For accuracy and durability these meters have the best kind of a reputation. The outer case of the Niagara is regularly made of gal-



vanized cast iron so proportioned that should the meter freeze, one-half will break, thus relieving the inner and more expensive parts from injurious strain. The broken half of the case is very cheaply replaced. The working parts are separate and removable from the outer case, and are carefully made of gun metal, German silver, bronze



Above Meter Reads 512,174 Cubic Feet. Square Case with Straight Reading Dial. Square Case with Standard Dial. Above Meter Reads 31,865 Cubic Feet.

and hard rubber composition, and are interchangeable throughout. The spuds of the Niagara are threaded to fit a size larger pipe than the opening in the meter, and it may therefore be set without couplings if desired. All Niagara meters are carefully tested for accuracy and to a hydraulic pressure of 300 pounds before shipping.

TO GROW GRASS IN THE SHADE.

The superintendent of parks of a Pennsylvania city sent to the bureau of information of the League of American Municipalities the following unique inquiry:

I am unable to make a good catch of grass in our parks, because the ground is quite shady, the trees being quite large and thick of growth. Can you tell me of some remedy or can you give me the name of some grass seed that will grow in the shade? Or must I cut out some of the trees?

In reply the bureau informed the superintendent that "grass can be grown in shady places, provided good seed is used and the soil is not sour. To ascertain whether or not the soil is sour, take a piece of blue litmus paper, turn some of the soil, wet it and then place it on top of the paper for ten to fifteen minutes; if the paper turns red the soil is sour. The remedy for sour soil is from one to two bushels of lime per one thousand square feet, according to the degree of redness shown on the paper by the test. To preserve a growth of grass close to large trees, fertilization will be necessary every year." A particular brand of seed was also recommended.

DIRECTORY OF MUNICIPAL ORGANIZATIONS.

League of American Municipalities.

President—John Mac Vicar, Mayor, Des Moines, Ia.
Vice-President—Charles A. Collier, Mayor, Atlanta, Ga.
Treasurer—Samuel L. Black, Mayor, Columbus, O.
Secretary—B. F. Gilkison, Downing Bldg., New York City.
Trustees—John Warner, Mayor, Peoria, Ill.
F. A. Walker, Council, Trenton, N. J.
C. M. Leitch, Council, Wilmington, Del.
Next Convention—Detroit, Mich., Aug. 1 to 4, 1898.

International Association of Fire Engineers.

President—A. J. Kennedy, New Haven, Conn.
Secretary—H. A. Hills, Wyoming, Ohio.
Treasurer—D. C. Larkin, Dayton, Ohio.
Next Convention—St. Louis, Mo., Oct. 18-20, 1898.

American Water Works Association.

President—John Caulfield, St. Paul, Minn.
Vice-Presidents—Joseph A. Bond, Wilmington, Del.
Charles P. Allen, Denver, Col.
John B. Beim, Madison, Wis.
R. L. Clayton, Atlanta, Ga.
Edmund Mather, Harrisburg, Pa.
Secretary-Treasurer—Peter Milne, Brooklyn, N. Y., care Municipal Bldg.
Next Convention—Buffalo, N. Y., June 14-17, 1898.

National Association of Chiefs of Police.

President—J. T. Janssen, Milwaukee, Wis.
Vice-President—W. G. Moore, Washington, D. C.
Secretary—Harry O. Carr, Grand Rapids, Mich.
Next Convention—Milwaukee, Wis., June 7-9, 1898.

American Society of Municipal Improvements.

President—Harrison Van Duyne, Newark, N. J.
Vice-Presidents—L. W. Rundlett, St. Paul, Minn.
E. H. Keating, Toronto, Can.
A. D. Thompson, Peoria, Ill.
Secretary—D. L. Fulton, Allegheny, Pa.
Treasurer—John L. Kennedy, Nashvillle, Tenn.
Next Convention—Washington, D. C., Oct. 12-14, 1898.

American Public Health Association.

President—Dr. Charles A. Linsley, New Haven, Conn.
Vice-Presidents—Dr. Benjamin Lee, Philadelphia, Pa.
Dr. J. C. Schrader, Iowa City, Ia.
Secretary—Dr. H. C. Probst, Columbus, O.
Treasurer—Dr. H. C. Bolton, Brattleboro, Vt.
Next Convention—Ottawa, Canada, Sept., 1898.

National Street Lighting Association.

President—D. Hunter, Jr., Allegheny, Pa.
Treasurer—C. E. Thompson, Binghamton, N. Y.
Secretary—Charles E. Burton, New Haven, Conn.
Asst. Secretary—C. F. Roberts, New Haven, Conn.
Next Convention—Binghamton, N. Y.

Association of Fire and Police Telegraph Superintendents and Municipal Electricians.

President—Will G. Ellett, Elmira, N. Y.
Vice-President—William Brophy, Boston, Mass.
Corresponding Secretary—H. F. Blackwell, New York.
Financial Secretary—Burt McAllister, Bradford, Pa.
Treasurer—Adam Bosch, Newark, N. J.
Chairman Executive Committee—F. C. Mason, New York.
Next Convention—Elmira, N. Y., Aug. 9, 1898.

National Firemen's Association of the United States.

President—F. A. Wood, Cedar Rapids, Ia.
Secretary—E. W. Barkman, Decatur, Ill.
Treasurer—H. S. Salisbury, Whitewater, Wis.
Next Convention—Chicago, Ill.

ATLAS

GUARANTEED TO BE SUPERIOR TO ANY IMPORTED CEMENT.

USED EXTENSIVELY FOR STREET PAVING, SEWERS, RESERVOIRS, BRIDGE WORK, PUBLIC BUILDINGS AND ALL KINDS OF PUBLIC WORK.

PORTLAND CEMENT.

IT IS THE STANDARD.

ATLAS CEMENT COMPANY,

143 Liberty Street, New York.

NEW FIRE ENGINE TESTED.

The new second size Amoskeag fire engine, which will be known as No. 5, and will be located at No. 5 engine house, Jersey City, was tested in the presence of a large number of city officials and others. The test proved highly satisfactory in every detail. The operations were directed by Mr. D. Arthur Burt, a representative of the Manchester Locomotive Works, which built the apparatus, and the engineer was Fred S. Bean. The firemen attached to Truck No. 1 and Engines Nos. 2 and 5 did all the heavy work, and were directed by Chief John Conway, Assistant Chief John T. Denmead and Battalion Chief John Hogan. Six minutes after a fire was started, with 2½ gauges of water, steam was up and the engine was sending forth a powerful stream of water taken from the Morris canal, which was sent high in the air through 50 feet of hose and a 1¼-inch nozzle. Then a double line was utilized, and two streams were sent up. Next the extended ladder of No. 1 truck was raised, and the water was sent from the top of it through a 3½-inch hose and 1¾-inch nozzle. At the conclusion of the test, which in the opinion of Fire Commissioners Mills, Cone and Brenan, and the fire officers, had exceeded the requirements, and was more than was expected, Mr. Burt entertained the board and a few others at dinner at Hotel Washington. Clerk Charles Estabrook, Capt. Fred Farrar, Samuel Blackie, John H. Ward, James T. Wheelihan, William A. Tilton and Counselor Charles Peshall were among the guests. Commissioner Mills made an address of welcome, and congraulated the builder upon turning out so perfect a piece of mechanism, and after the dinner several speeches were made. Commissioner Cone said he was more than satisfied with the engine.—Jersey City *Evening Journal.*

ALUMINUM FIRE HATS.

To Municipal Corporations, Firemen, the Trade and the Public in General:

You are hereby notified that the "Monarch" ventilated aluminum fire hat is no infringement upon any fire hat which has ever been manufactured. Aluminum and metal fire hats are not patentable. Firemen and the trade should not be deceived by notices which are appearing in the fire papers, claiming that certain manufacturers have the sole patents and privileges on this style of hat. We have looked into this mater ourselves. The only patent they have covers the felt lining on the inside of the hat, and we do not infringe upon this in any way. This style of hat has been used, in other material, for twenty-five or thirty years. If their published notices are directed against us, we will say that it is simply a bluff, and firemen, the trade and the public need take no notice of it.

A. W. Dolfini & Co.

—This year's tax budget at Mount Vernon, N. Y., amounts to $237,118, and the rate is fixed at 1.444. Last year the budget amounted to $268,294, and the rate was 2.2986. The rate for this year is said to be the lowest since Mount Vernon became a city.

EDMUND B. WESTON,
Consulting and Civil Engineer, M. Am. Soc. C. E., M. Inst. C. E., 86 Weybosset Street,
Providence, R. I.
Asst City Engineer in Charge of the Providence (R. I.) Water Department from 1878 to 1897. Specialties: Water Supply, "Natural Filtration," "Mechanical Filtration," Fire Protection, Sewerage, Municipal Work, Expert Testing of Pumping Engines, etc.

McCaskey & Holcomb Company,
CONTRACTORS,
... SPRINGFIELD, ILL.
415 Commercial Building, ST. LOUIS, MO.
We make a specialty of constructing Municipal Electric Lighting Plants.
Send for Estimates and Valuable Information.

Our Name and Brand a guarantee of quality.
HIGH GRADE
RUBBER GOODS
FIRE HOSE,
STEAM HOSE,
WATER HOSE,
BELTING,
PACKING,
MATS, MATTING,
AND STAIR TREADS,
TUBING, GASKETS,
SPRINGS, VALVES, Etc.
Send for Catalogue, Samples and Prices.
N. J. CAR SPRING & RUBBER CO.,
MAIN OFFICE AND WORKS, JERSEY CITY, N. J.
CHICAGO STORE, 175-177 LAKE STREET.

The Frank B. Rae Engineering Company,
ELECTRICAL AND MECHANICAL ENGINEERS.
Suite 910, Fort Dearborn Building, No. 134 Monroe Street, Chicago, Illinois.
Member American Institute Electrical Engineers. .....
This company makes a specialty of "Municipal Engineering," estimates of cost of plant, cost of operation, plans, specifications, supervision and final tests upon Electric Lighting and Water Works Plants.
References by permission:
Hon. H. S. Pingree, Governor, Lansing, Michigan.
Hon. John MacVicar, Mayor, Des Moines, Iowa
Hon. Edward W. Brown, Mayor, Rockford, Ill.
Hon. W. G. Mellinger, Mayor, Cumberland, Md
Also to the Mayors of the following cities:
Madison, Wisconsin; Sycamore, Woodstock, Illinois; London, Bryan, Columbiana, Ohio; Lansing, Hillsdale, Negaunee, Evert, West Bay City, Michigan; Springville, New York, etc.
Correspondence solicited.

ELECTRIC LIGHT AND GAS PLANTS.
TO PARTIES WANTING AN
Electric Light, or Gas Plant designed, built or remodeled, estimates will be gladly submitted.
EXISTING COMPANIES
Take advantage of our experience in remodeling old plants and making them up-to-date.
WE CAN CLEARLY SHOW
Managers of Gas or Electric Companies how our plants are operated at so low a cost.
WE REFER TO THE LARGE NUMBER OF PLANTS WE HAVE INSTALLED AND REMODELED.
CORRESPONDENCE SOLICITED.
THE NEW ENGLAND ENGINEERING CO., WATERBURY, CONN.

FIRE ENGINES TESTED AT NEW ORLEANS.

Some time ago orders were placed by the city of New Orleans, La., with the American Fire Engine Company, Seneca Falls, N. Y., for twenty steam fire engines. Seventeen of the number have been built, tested and accepted by the city. Reporting the trial of the last two of these engines, recently delivered, the New Orleans *Picayune* says: "These engines were ordered for heavy service in the commercial part of the city, and will be placed in the houses of engine companies Nos. 2 and 6. They are of the crane neck pattern, with platform running gear in front; the pumps are 4¾ inches in diameter, with 8-inch stroke; the steam cylinders are 8 inches in diameter, 8-inch stroke; their capacity is 800 gallons of water per minute. They embrace all the modern improvements, and heaters are also attached, whereby the water in the boilers can be kept at a boiling point, which will enable them to generate steam rapidly after the fire in the furnace has been lighted. The severe trial tests made of these engines was by direction of the apparatus committee and supervised by Chief O'Connor, as these gentlemen were particularly anxious to ascertain their power and capacity. After several tests with single lines of hose and various sized nozzles, the Siamese connections were applied, and large streams were forced with tremendous velocity through the air. The fire commissioners present expressed themselves well pleased with the result of the tests, and the engines will be placed in commission immediately." The three additional engines of the original order of twenty are now being built at the Cincinnati plant of the American Fire Engine Company.

TRADE NOTES.

—New Orleans, La., has recently received its fourth trussed outfit from Seagrave & Co.

—Adrian, Mich., has just ordered a full trussed hook and ladder truck from Seagrave & Co.

—George C. Hale, chief of the fire department at Kansas City, Mo., has invented a new combination nozzle.

—The Myers American Ballot Machine Company, of Rochester, N. Y., has made an assignment to William P. Davis.

—Larchmont, N. Y., have purchased a Seagrave trussed truck and outfit through the eastern representatives, Gleason & Bailey, of New York.

—New York city has recently received its sixth consignment of Seagrave trussed ladders up to 80 feet in length, sold by the eastern representatives, Gleason & Bailey, of that city.

—Members of No. 9 hook and ladder company, New York city, saved several lives at a fire Sunday, March 13, with the celebrated Seagrave trussed ladders, bought recently from the Gleason & Bailey Manufacturing Company.

—The 1898 catalogue of the National Cycle Manufacturing Co., of Bay City, Mich., is a neat and attractive book, between the covers of which all the good points of the National bicycle are set forth. The National, by the way, is one of the best and most popular wheels on the market.

—The Trans-Mississippi Exposition buildings are to be protected during the exposition with a full trussed hook

THOMSON METER CO., 79-83 Washington Street, BROOKLYN, N. Y.

The 100,000 Mark.

ON MARCH 31, 1894, THIS COMPANY STAMPED METER No. 50,000.
ON AUGUST 24, 1897 (3 YEARS, 4 MONTHS AND 24 DAYS AFTER), THIS COMPANY STAMPED METER No. 100,000.

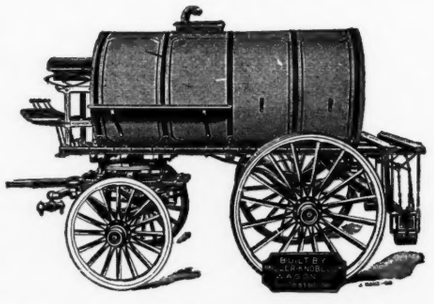
We stamp our meters only as we sell them.

Catalogue and Price List furnished on application.

THE MILLER TRACK SPRINKLER
FOR STREET RAILWAYS

SPRINKLERS.

MILLER
WIDE THROWING
SPRINKLING CARS.
FOR SALE OR LEASE.
Will Sprinkle from Curb to Curb. Instant Regulation for Width or Amount of Water.



MILLER SPRINKLING WAGONS ARE STANDARD.
Send for Catalogues of CARS OR WAGONS.
THE MILLER-KNOBLOCK COMPANY,
New York Office, 390 Hudson Street. SOUTH BEND, INDIANA.

and ladder truck and two hose wagons made by the well-known firm of Seagrave & Co., of Columbus, O. After the exposition this apparatus goes into the service of the Omaha fire department.

—The Joseph Dixon Crucible Company, of Jersey City, have issued a very interesting pamphlet on the subject of "Friction and Lubrication." It treats the subject intelligently and thoroughly, and incidentally cites tests of the lubricating value of Dixon's pure flake graphite. The pamphlet should be read by all engineers, especially.

—Seagrave & Co. are now building trussed goods for Bushnell, Ill.; Charleston, S. C.; Rochester, Mich.; Islip and Hoboken, N. J.; Larchmont, N. Y.; a trussed truck and two hose wagons for the Trans-Mississippi Exposition and Omaha, Neb., and a number of other cities and towns, and report a daily increasing demand and number of orders for trussed goods.

—The Michigan Pipe Company, of Bay City, Mich., is working on an order for 14,685 creosoted tamarac cross-ties for the Denver Consolidated Tramway Company. The Denver Consolidated Tramway Company purchased 1,600 creosoted ties from the Michigan Pipe Company last year, and after investigating the merits of creosoted ties, have placed this large order for their 1898 improvements.

—The city of Eureka, Cal., has in its fire department a first size Silsby engine that has been in service for twenty-five years, and which, with the exception of a new boiler, has never had a dollar spent on it for repairs. The American Fire Engine Company, Seneca Falls, N. Y., builders, recently received a letter from H. L. Ricks, engineer, regarding a late test made with the engine, in which he says: "We played for about twenty minutes with a 1½-inch nozzle, 100 feet of hose siamesed, and maintained a water pressure of from 140 pounds to 160 pounds, throwing a distance of 260 feet."

—Futher time has been granted by the Executive Committee to intending exhibitors to close contracts for space at the Trans-Mississippi Exposition. On May 25 no further exhibits will be received, and any exhibitor

Contractors' Drainage Sewerage } **Pumps,**

Handling Dirty, Gritty and Sandy Liquids without Wear, Oil or Care. Pumping Outfits for Contractors, Mining, Irrigating, Railroad, Quarry, Drainage and Manufacturing purposes. Second-hand Engines, Boilers, Pumps and other Machinery always on hand. Exchanging.

MASLINS, 165-167 First St, Jersey City, N. J.

DIXON'S SILICA GRAPHITE PAINT

FOR TIN OR SHINGLE ROOFS AND IRON WORK. Tin roofs well painted have not required repainting for 10 to 15 years.
IT IS ABSOLUTELY WITHOUT AN EQUAL.
If you need any paint it will pay you to send for circular.
JOSEPH DIXON CRUCIBLE CO., Jersey City, N. J.

ALCATRAZ ASPHALT

(Guaranteed Free from Coal Tar or Petroleum Residuum.)

TRADE MARK ALCATRAZ AA ASPHALT REGISTERED

— FOR —

Street Pavements, Sidewalks, Floors, Etc.

The Alcatraz Company,
SAN FRANCISCO, CAL.
General Eastern Offices, 57 East 59th St., N. Y. City.

American Car Sprinkler Co.

(INCORPORATED.)

F. W. WELLINGTON, Pres. ALFRED THOMAS, Treas.
M. J. WHITTALL, V.-Pres. FRANK D. PERRY, Gen. Supt.

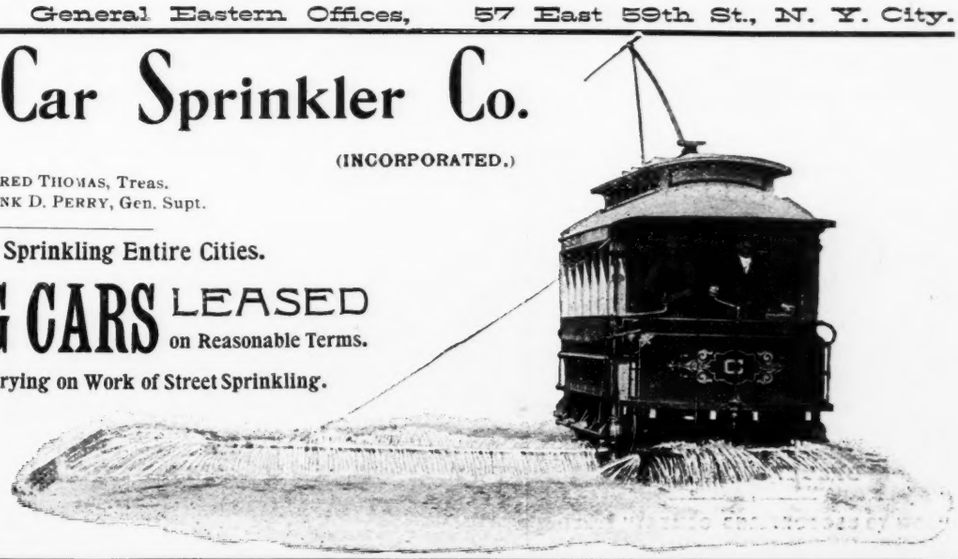
Contracts Solicited for Sprinkling Entire Cities.

SPRINKLING CARS LEASED on Reasonable Terms.

Local Companies Formed for Carrying on Work of Street Sprinkling.

Worcester, Mass.

THIS COMPANY controls all patents of the United Tramway Sprinkler Co., Louisville, Ky.



Defender Nozzle Fine Spray Keeps Face Cool Drives Smoke
Gleason's Purchasing Agency, 265 Broadway, New York

Star Extinguishers
Silver Bottle Cage--Glass Stopper--Perfect.
Gleason's Purchasing Agency, 265 Broadway, New York

Dor-ti-cus Leak Stop
A HOSE JACKET--DOES STOP LEAKS.
Gleason's Purchasing Agency, 265 Broadway, New York

not having his material on the ground at that time will be shut out. This rule will be strictly enforced, as the entire time between then and June 1 must be utilized for the installing of exhibits, so that everything will be in readiness for the inspection of visitors when the gates are opened. Exception will be made to this rule in certain cases where exhibits have been unavoidably delayed for some good reason. When such cases occur exhibits will be admitted to the ground after June 10, but between May 25 and June 10 no exhibits will be received. This step is necessary in order to avoid confusion in the installing work preparatory to opening. Ten days later a few exhibits, chiefly those of horticulture and agriculture, which cannot be made ready by June 1, will be received. On May 1 the floor in each of the exhibition buildings will be diagramed with black lines, showing the proper space assigned to each exhibitor.

AN ARTISTIC CATALOGUE.

One of the handsomest pieces of printed matter to reach this office is the new catalogue of the Murray Iron Works Co., of Burlington, Iowa. Within its artistic covers are some excellent half-tone illustrations of high pressure tubular boilers, for the manufacture of which the Murray Company is famed throughout the country.

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UNIFORMS

for Police and Firemen.

He who makes the best goods gets the most business.

The largest manufacturer of uniforms in America is

THE M. C. LILLEY & CO., Columbus, Ohio.

Catalogues and full information free.

H. Stevens' Sons Co., MACON, GA.

MANUFACTURERS OF

SEWER and R. R. CULVERT PIPE

Fire Brick, Milled Clay Flue Pipe and Chimney Tops, Urns, etc. Correspondence solicited

Awarded Gold Medal Cotton States and International Exposition, 1895.

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And Portland Cement Sidewalks.

ESTIMATES FURNISHED ON ALL CLASSES OF CEMENT CONSTRUCTION.

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FRED. W. BROWN, Secretary.

UNEQUALLED BUCKEYE Portland CEMENT BELLEFONTAINE, O.

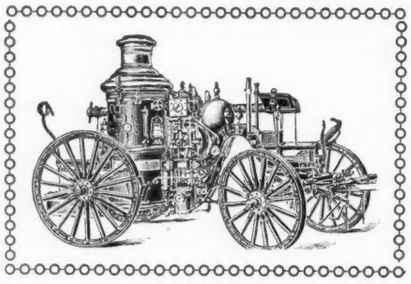
MANUFACTURED BY

BUCKEYE PORTLAND CEMENT CO.,

BELLEFONTAINE, O.

"HOW TO USE PORTLAND CEMENT" sent free on application.

THE AMERICAN PISTON AND ROTARY STEAM Fire Engines.



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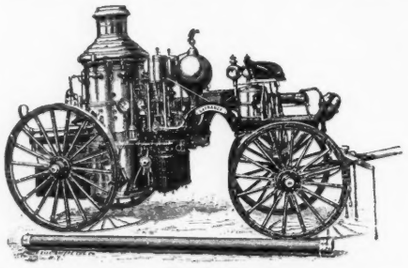

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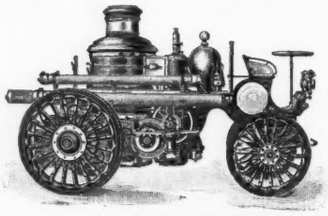

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